Go To Table Of Contents

354

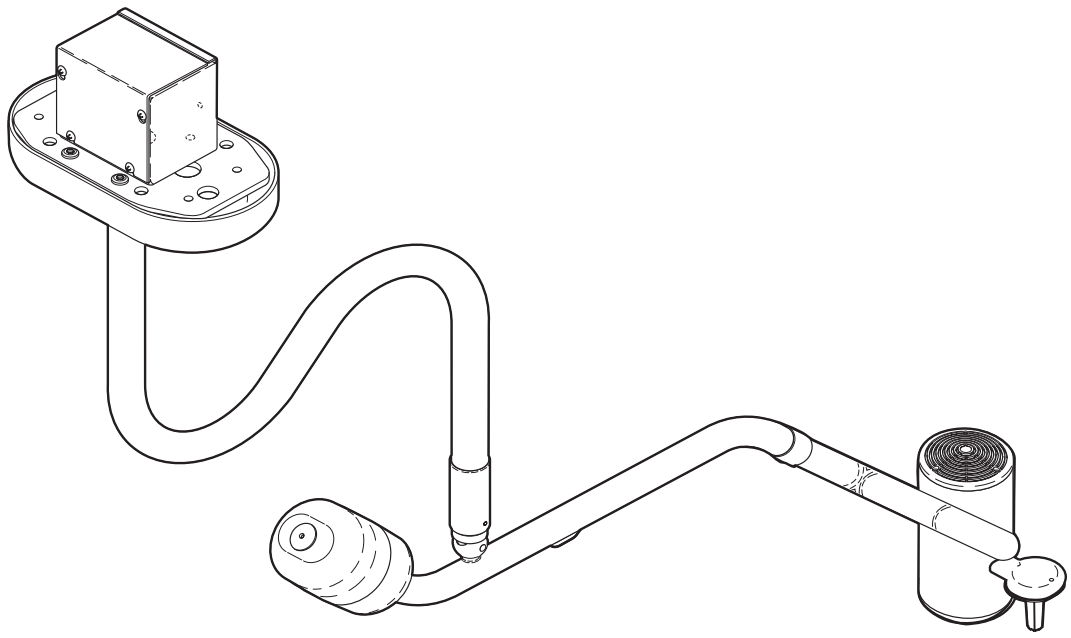
-001 thru -004
-007 thru -010
-016 thru -019
-025, -026, -028, -029
-031, -032, -034, -035
-037, -038, -040, -041

Ritter® by MIDMARK

Ceiling Lighting System

Service and Parts Manual

Serial Number Prefixes:
KN, KP, LY, LZ, MA, MB,
KS, KT, MD, ME, MX & MZ



MA458100

FOR USE BY MIDMARK
TRAINED TECHNICIANS ONLY

SF-1771

Part No. 004-0309-00 Rev. C (1/01/04)

Go To Table Of Contents

TABLE OF CONTENTS

Section/Paragraph.....Page

IMPORTANT INSTRUCTIONS
General Safety Instructions.....ii
Safety Alert Symbols.....ii
Warranty Instructions ii

SECTION I GENERAL INFORMATION
1.1 Scope of Manual 1-1
1.2 How to Use Manual 1-1
1.3 Description Of 354 Lighting System 1-1
1.4 Specifications 1-3
1.5 Parts Replacement Ordering 1-3
1.6 Special Tools 1-5

SECTION II TESTING AND TROUBLESHOOTING
2.1 Operational Test (See Figure 2-1) 2-1
2.2 Troubleshooting Procedures 2-3

SECTION III SCHEDULED MAINTENANCE
3.1 Scheduled Maintenance 3-1

SECTION IV MAINTENANCE/SERVICE INSTRUCTIONS
4.1 Introduction..... 4-1
4.2 Typical Fuse Removal / Installation..... 4-1
4.3 Typical Transformer Removal / Installation Early Units..... 4-2
4.4 Typical Transformer Removal / Installation Later Units..... 4-3
4.5 Transformer Input Tap Adjustment Early Units..... 4-5
4.6 Transformer Input Tap Adjustment Later Units..... 4-6
4.7 Typical Fuse Holder Removal / Installation..... 4-8
4.8 ON / STANDBY Switch Removal / Installation..... 4-9
4.9 Lighthead Removal / Installation 4-10
4.10 Fan Assembly Removal / Installation 4-10
4.11 Bulb Removal / Installation..... 4-12
4.12 Bulb Socket Removal / Installation..... 4-13
4.13 Iris Diaphragm Removal / Installation..... 4-14

Section/Paragraph ..... Page

4.14 Lens Removal / Installation..... 4-16
4.15 Cross Tube Counterbalance Adjustment 4-18
4.16 Ball Pivot Joint Tension Adjustment..... 4-19
4.17 Ball Pivot and / or Ball Pivot Stop Removal / Installation 4-20
4.18 Lamp Tube Brake Adjustment..... 4-23
4.19 Lighthead Brake Adjustment..... 4-23
4.20 Lighthead Pivot Bearing Stop Removal / Installation..... 4-24
4.21 Main Pivot Stop Removal / Installation 4-25
4.22 Lamp Tube Pivot Stop Removal / Installation 4-26

SECTION V SCHEMATICS AND DIAGRAMS
5.1 Electrical Schematics / Wiring Diagrams 5-1

SECTION VI PARTS LIST
6.1 Introduction 6-1
6.2 Description Of Columns..... 6-1
6.3 Torque Specifications And Important Assembly Notes..... 6-1
354 Ritter Single Light System..... 6-2
354 Ritter Double Light System 6-3
354 Midmark Single Light System 6-4
354 Midmark Double Light System 6-5
354 Ritter Combination Light System† 6-6
354 Midmark Combination Light System† ... 6-7
Down Tube Assembly ..... 6-8.*
Single Ceiling Plate Assembly ..... 6-9.*
Double Ceiling Plate Assembly..... 6-10.*
Combination Ceiling Plate Assembly ..... 6-11.*
Cross Tube Assembly..... 6-12.*
Lamp Tube Assembly 6-13
Lighthead Assembly..... 6-14.*
Bulb Carriage Assembly 6-15
Optic Assembly ..... 6-16.*

COMMENTS..... 7-1
FAX ORDER FORM..... 7-2

(†) For parts information on the 355 portion of 354 (-016 thru -019 & -037, -038, -040, -041) combination units, refer to the appropriate 355 Service and Parts Manual.

(*) Indicates that there has been a serial number break for the illustration and that there are additional point page(s) following the original page.

© Midmark Corporation 2000 SF-1771 Rev. 1/03

Printed in U.S.A.

TABLE OF CONTENTS

General Safety Instructions

Safety First: The primary concern of Midmark Corporation is that this lighting system is maintained with the safety of the patient and staff in mind. To assure that services and repairs are completed safely and correctly, proceed as follows:

(1) Read this entire manual before performing any services or repairs on this lighting system.

(2) Be sure you understand the instructions contained in this manual before attempting to service or repair this lighting system.

Safety Alert Symbols

Throughout this manual are safety alert symbols that call attention to particular procedures. These items are used as follows:

DANGER

A DANGER is used for an imminently-hazardous operating procedure, practice, or condition which, if not correctly followed, will result in loss of life or serious personal injury.

WARNING

A WARNING is used for a potentially hazardous operating procedure, practice, or condition which, if not correctly followed, could result in loss of life or serious personal injury.

CAUTION

A CAUTION is used for a potentially hazardous operating procedure, practice, or condition which, if not correctly followed, could result in minor or moderate injury. It may also be used to alert against unsafe practices.

EQUIPMENT ALERT

An EQUIPMENT ALERT is used for an imminently or potentially hazardous operating procedure, practice, or condition which, if not correctly followed, will or could result in serious, moderate, or minor damage to unit.

NOTE

A NOTE is used to amplify an operating procedure, practice or condition.

Warranty Instructions

Refer to the Midmark “Limited Warranty” printed in the Installation and Operation Manual for warranty information. Failure to follow the guidelines listed below will void the warranty and/or render the 354 Lighting System unsafe for operation.

- In the event of a malfunction, do not attempt to operate the lighting system until necessary repairs have been made.
- Do not attempt to disassemble lighting system, replace malfunctioning or damaged components, or perform adjustments unless you are one of Midmark’s authorized service technicians.
- Do not substitute parts of another manufacturer when replacing inoperative or damaged components. Use only Midmark replacement parts.

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

SECTION I
GENERAL INFORMATION

1.1 Scope of Manual

This manual contains detailed troubleshooting, scheduled maintenance, maintenance, and service instructions for the 354 Lighting System. This manual is intended to be used by Midmark's authorized service technicians.

1.2 How to Use Manual

A. Manual Use When Performing Scheduled Maintenance.

(1) Perform inspections and services listed in Scheduled Maintenance Chart (Refer to para 3.1).

(2) If a component is discovered to be faulty or out of adjustment, replace or adjust component in accordance with maintenance / service instructions (Refer to para 4.1).

B. Manual Use When Light Is Malfunctioning And Cause Is Unknown.

(1) Perform an operational test on Light (Refer to para 2.1).

(2) Perform troubleshooting procedures listed in Troubleshooting Guide (Refer to para 2.2).

(3) If a component is discovered to be faulty or out of adjustment, replace or adjust component in accordance with maintenance / service instructions (Refer to para 4.1).

C. Manual Use When Damaged Component Is Known.

(1) Replace or adjust component in accordance with maintenance / service instructions (Refer to para 4.1).

1.3 Description Of 354 Lighting System

A. General Description (See Figure 1-1).

The 354 Lighting System is a compact spotlight designed specifically for performing general medical examinations and procedures. Listed are the models currently available:

354-001,-007,-028, -029 .....9 ft., Single Light System
354-002,-008,-034,-035 ..... 9 ft., Double Light System
354-003,-009,-025, -026 .....8 ft., Single Light System
354-004, -010,-031, -032 ..... 8 ft., Double Light System
354-016*,-018*
-040*,-041*.....9 ft.,354 / 355 Combo System
354-017*,-019*
-037*,-038*.....8 ft.,354 / 355 Combo System

* *When servicing the 355 portion of this lighting system, refer to the appropriate 355 Service and Parts Manual.*

The major serviceable components of the lighting system are the transformer, fuse / fuse holder, bulb socket, ON / STANDBY switch, fan assembly, iris diaphragms, lenses, main pivot stop, counterbalance assembly, ball pivot joint assembly which includes ball pivot stop, lamp tube pivot stop, lighthead pivot bearing stop, lamp tube brake assembly and lighthead brake assembly.

B. Theory of Operation (See Figure 5-1 for wiring diagram / electrical schematic)

Line voltage (approximately 110-120 VAC) is supplied thru the line fuse (F1 and/or F2) to the transformer. If too much current is drawn by the lighting system's circuitry, the line fuse(s) (F1 and/or F2) blow.

Transformer will provide 20.82 +/- 0.62 VAC output to power the light / fan circuit based on an ideal 120.0 VAC input. Because there are facilities which cannot supply the ideal level of input voltage, the transformer is designed with three different primary input taps which can be used, based on the voltage level available at a particular facility. If the facility's voltage is 117.0 VAC or lower, the 114.0 VAC (yellow) transformer input tap must be used. If the facility's voltage is between 117.1 to 123.0 VAC, the 120.0 VAC (orange) transformer input tap must be used. If the facility's voltage is 123.1 VAC

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

SECTION I
GENERAL INFORMATION

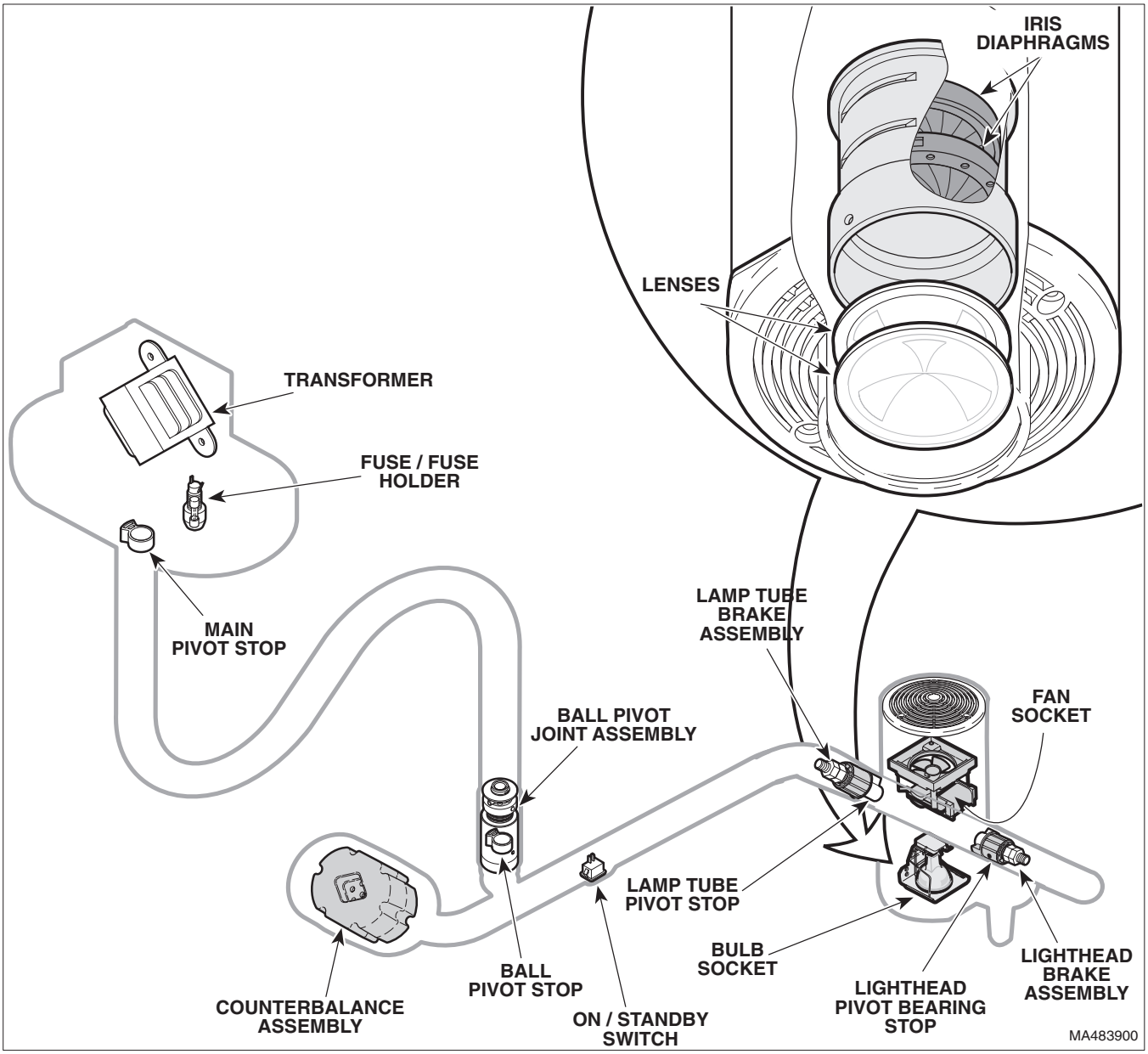


Figure 1-1. Major Components

or higher, the 126.0 VAC (red) transformer input tap must be used. Using the correct transformer input tap will result in a transformer output of 20.82 +/- 0.62 VAC.

When the ON / STANDBY switch is switched to ON, the output voltage from the transformer secondary tap is applied across the bulb assembly and the fan motor causing the bulb to illuminate and the fan to operate. Turning the ON / STANDBY switch to STANDBY opens the circuit, causing the bulb to stop illuminating and the fan to stop operating. However, power is still applied to the primary side of the transformer.

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

1.4 Specifications

Factual data for the 354 Lighting System is provided in Table 1-1. Also, see Figure 1-2.

Table 1-1. Specifications

Description	Data
Weight of a Unit:	
8 ft (2.44 m) single light	59.0 lbs (26.8 kgs)
9 ft (2,74 m) single light	60.0 lbs (27.2 kgs)
8 ft (2.44 m) dual light	105 lbs (47.6 kgs)
9 ft (2.74 m) dual light	107 lbs (48.5 kgs)
Torque load of a unit on its ceiling plate:	
8 ft (2.44 m) single light	69 ft-lbs (94 N•m)
9 ft (2.74 m) single light	69 ft-lbs (94 N•m)
8 ft (2.44 m) dual light	136 ft-lbs (184 N•m)
9 ft (2.74 m) dual light	137 ft-lbs (184 N•m)
Shipping Carton:	
Single System	61.0 in. "L" x 30.5 in. "W" x 10.5 in. "H" (154.9 cm x 77.5 cm x 26.7 cm)
Beam diameter@ 36 in. (91.4 cm):	Variable from 3 to 10 in. (7.6 to 25.4 cm)
Diameter of Lighthead:	5.0 in. (12.7 cm)
Focal Length:	36 in. (91.4 cm)
Reach of Arm Assemblies:	49.0 in. (124.5 cm) maximum (from centerline of down tube to center of lighthead)
Rotation of Lighthead:	180° of rotation at lamp tube connection
Rotation of Lamp Tube:	540° of rotation at cross tube connection
Rotation of Cross Tube:	580° of rotation at down tube connection
Vertical Range of Cross Tube:	-35° to +35° of vertical movement
Rotation of Down Tube:	580° of rotation at ceiling plate connection
Bulb:	21 VAC, 150 W Halogen Bulb
Electrical Requirements:	110-120 VAC, 60 HZ 1.5 amp, single phase
Power Consumption (at bulb):	20.0 VAC @ 7.0 amps = 141.4 Watts
The following data applies to all models with serial numbers beginning with KN, KP, LY, LZ, MA, MB, KS, KT, MD, & ME:	
Fuse Rating:	3 amp, 250 VAC 1/4 x 1 1/4, Type Slo-Blo
Color Temperature:	3,200K
Illumination @ 36 in.(91.4 cm):	5,000 fc (53,800 lux)
The following data applies to models with serial numbers MX1000 & MZ1000 thru present:	
Fuse Rating:	1.6 amp, 250 VAC 1/4 x 1 1/4, Type Slo-Blo
Color Temperature:	4,200K
Illumination @ 36 in.(91.4 cm):	4,000 fc (43,000 lux)

1.5 Parts Replacement Ordering

If a replacement part is required, order the part directly from the factory as follows:

(1) Refer to Figure 1-2 to determine the location of the model number and serial number of the lighting system and record this data.

(2) Refer to the Parts List to determine the item numbers of the parts, part numbers of the parts, descriptions of the parts, and quantities of parts needed and record this data (Refer to para 6.1).

NOTE
Ask the Purchasing Department of the company that owns the lighting system for this information. Otherwise, this information may be obtained from the dealer that sold the lighting system.

(3) Determine the installation date of the lighting system and record this data.

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

SECTION I
GENERAL INFORMATION

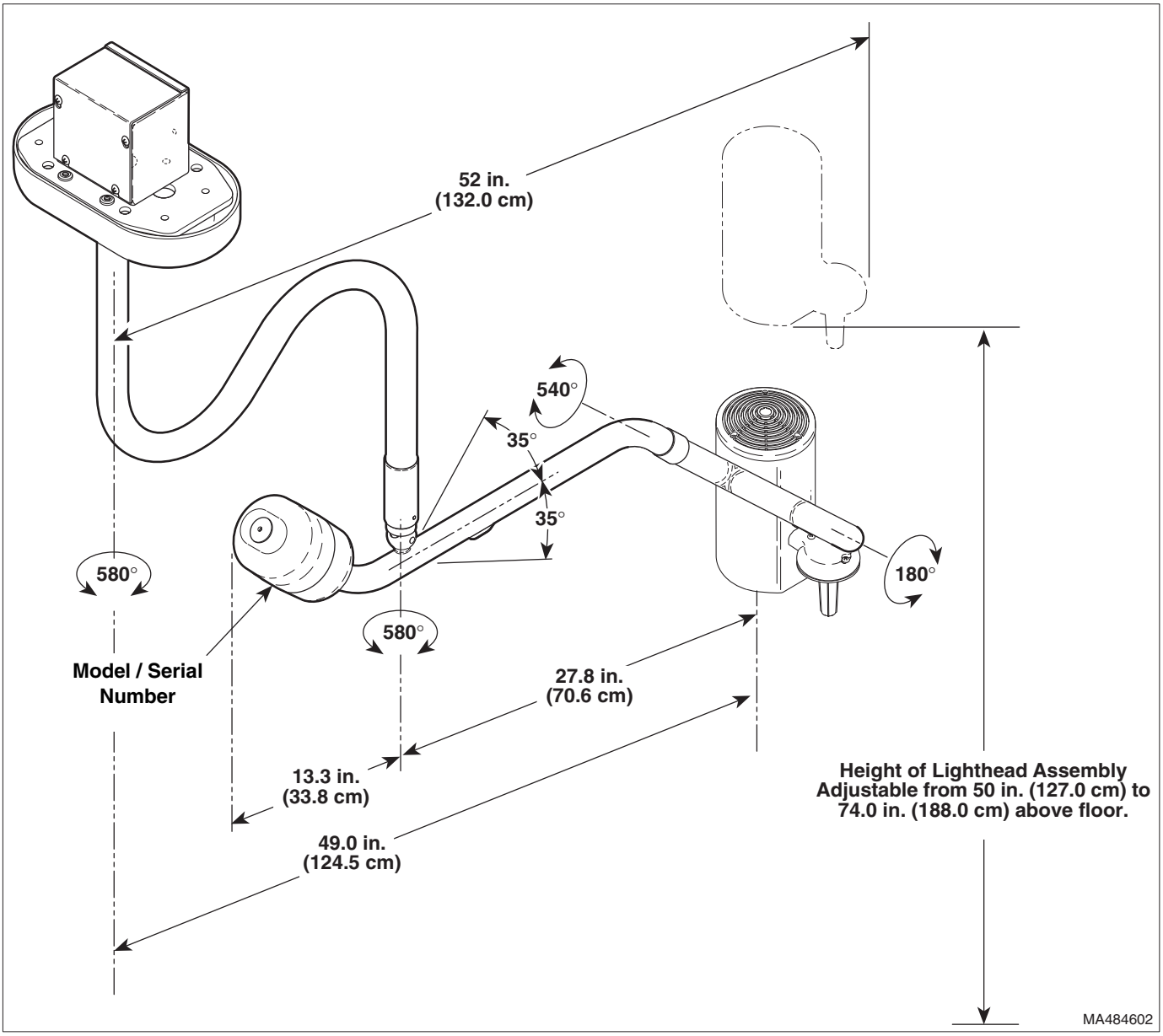


Figure 1-2. Dimensions / Serial Number Location

(4) Call Midmark with the recorded information and ask for the Medical Products Technical Services Department. See back cover of this manual for the phone number or use the Fax Order Form (See page 7-2 for Fax Order Form).

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

SECTION I
GENERAL INFORMATION

1.6 Special Tools

Table 1-2 lists all of the special tools needed to repair the lighting system, how to obtain the special tools, and the purpose of each special tool.

Table 1-2. Special Tool List

Description of Special Tool	Manufacturer's Name / Address / Phone	Manufacturer's Part Number	Purpose of Special Tool
Multimeter	Commercially Available	Any Type	Used to perform continuity and voltage checks.
Torque Wrench	Commercially Available	Any Type	Used to tighten nuts or screws to specified values.

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

SECTION I
GENERAL INFORMATION

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

SECTION II
TESTING AND TROUBLESHOOTING

2.1 Operational Test (See Figure 2-1)

In order to effectively diagnose a malfunction of the 354 Lighting System, it may be necessary to perform an operational test as follows*:

WARNING
Refer to the Operator Manual for complete instructions on operating the lighting system. Failure to do so could result in personal injury.

NOTE
The Operational Test, for the most part, only describes what should happen when the lighting system is operated. If the lighting system does something other than described, a problem has been discovered. Refer to the Troubleshooting Guide to determine the cause of the problem and its correction.

(1) Turn the ON / STANDBY switch (A, Figure 2-1) to ON.

(2) ***Observe.*** The lighthead (2) should illuminate and the fan in the back of the lighthead should be operating.

(3) Position the lighthead (2) 36 in. (91.4 cm) from the table (or wall) and aim the light beam at the table (or wall).

(4) ***Observe.*** There should be an evenly distributed circular pattern of bright light, approximately 3 in. to 10 in. (7.6 cm to 25.4 cm) in diameter, on the table (or wall) surface.

(5) Rotate the lighthead (2), lamp tube (3), cross tube (4) and down tube (5) through their range of motions as shown on the illustration (See Figure 2-1).

(6) ***Observe.*** The lighthead (2) should be able to be positioned easily through its entire range of motion. Also, the light should not flicker intermittently when the lighthead is being positioned.

(7) Move the lighthead (2) to different positions, release the lighthead, and observe it.

(8) ***Observe.*** When the lighthead (2) is released in any position, no drifting should occur at any axis.

(9) Adjust the brightness control lever (6) through its range of motion.

(10) ***Observe.*** The light beam should brighten / darken as the brightness control lever is adjusted.

(11) Position the brightness control lever (6) to get the maximum brightness and then adjust the beam size lever (7) through its range of motion.

(12) ***Observe.*** The light beam pattern should change from approximately 3 in. (7.6 cm) to 10 in. (25.4 cm) as the beam size lever (7) is adjusted.

(13) Turn the ON / STANDBY switch (A) to STANDBY.

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

SECTION II
TESTING AND TROUBLESHOOTING

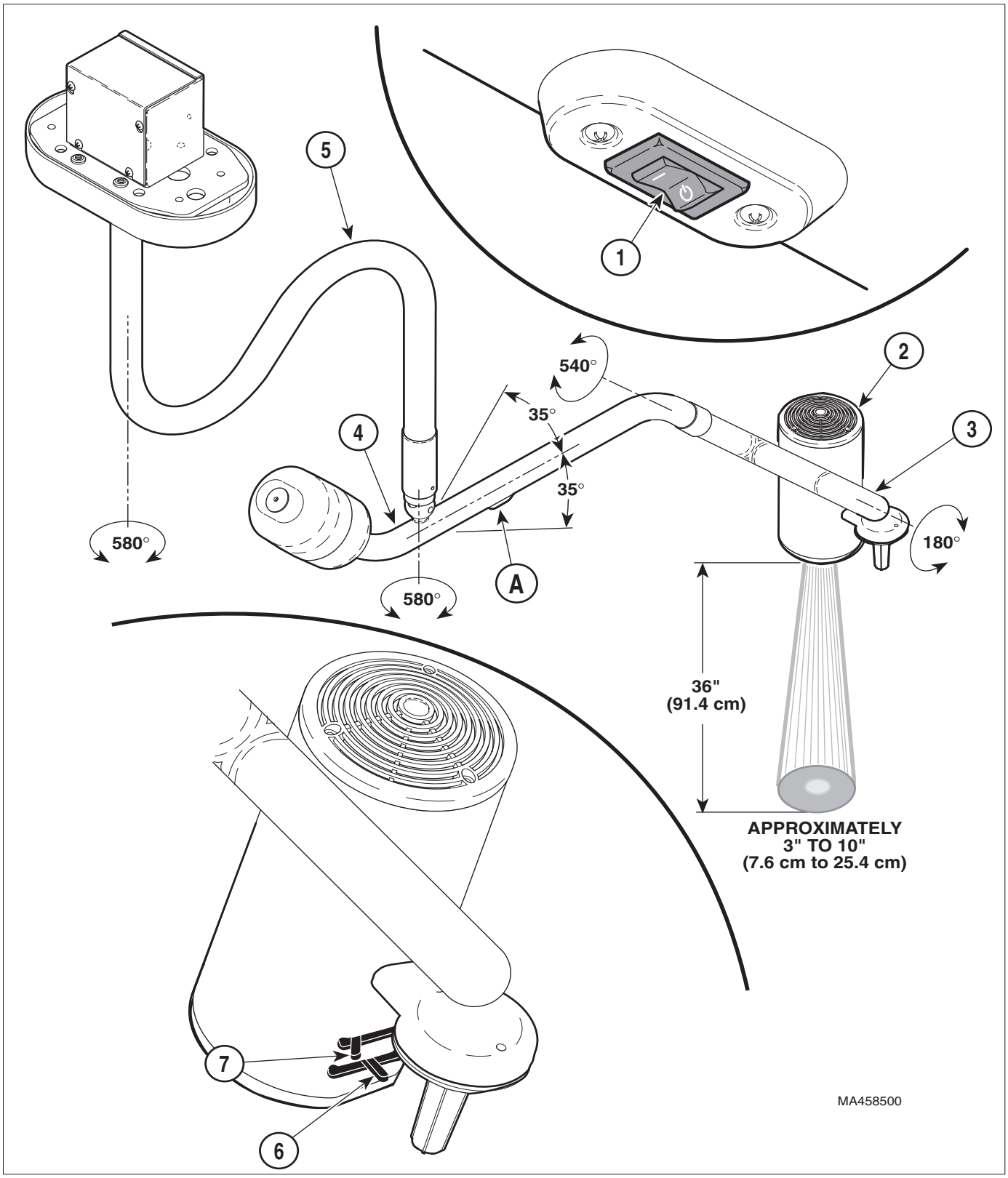


Figure 2-1. Operational Test

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

2.2 Troubleshooting Procedures

Table 2-1 is a Troubleshooting Guide which is used to determine the cause of the malfunction.

Table 2-1. Troubleshooting Guide

Problem	Symptom	Probable Cause	Check	Correction
Lighthead will not illuminate, and fan does not function.	Lighthead / fan will not function even though ON / STANDBY switch is turned to ON.	Facility circuit breaker providing power to unit is tripped.	Check to see if facility circuit breaker for unit is tripped.	If facility circuit breaker is tripped, determine what caused the circuit breaker to trip, correct the problem, and then reset / replace the circuit breaker.
		Line fuse (located in junction box) is blown.	Perform continuity check on line fuse.	Replace line fuse. Refer to para 4.2.
		Fuse holder is malfunctioning.	Perform continuity check on fuse holder.	Replace fuse holder. Refer to para 4.7.
		ON / STANDBY switch is malfunctioning.	Perform continuity check on ON / STANDBY switch.	Replace ON / STANDBY switch. Refer to para 4.8.
		Transformer is malfunctioning.	Check for 20.82 +/- 0.62 VAC across output leads of transformer when the ON / STANDBY switch is ON.	If 20.82 +/- 0.62 VAC is not present when ON / STANDBY switch is ON, replace transformer. Refer to para 4.3 ***or*** 4.4.
		Wiring is torn, broken, or disconnected somewhere within the arm assembly.	Perform a continuity check on blue and brown wiring running from transformer to lighthead.	Replace or repair any torn, broken, or disconnected wiring.
	Lighthead / fan will not function or function intermittently when lighthead or arm assemblies are moved.	Wiring is torn, broken, or disconnected somewhere within the arm assemblies.	Perform a continuity check on blue and brown wiring running from transformer to lighthead.	Replace or repair any torn, broken, or disconnected wiring.
Fan functions properly, but lighthead will not illuminate.	Fan functions properly, but lighthead will not illuminate even though ON / STANDBY switch is turned to ON.	Bulb is burned out or has not been installed.	Replace suspect bulb with known working bulb.	Replace bulb. Refer to para 4-11.
		Wiring is torn, broken, or disconnected somewhere within the lighthead.	Check for torn, broken, or disconnected wiring within lighthead.	Replace any torn, broken,or disconnected wiring within lighthead.
		Bulb socket is corroded resulting in bad connection.	Clean bulb socket or replace with known working bulb socket.	Replace bulb socket. Refer to para 4-12.
Lighthead illuminates properly, but fan does not function.	Lighthead illuminates properly, but fan does not function even though ON / STANDBY switch is turned to ON.	Wiring is torn, broken, or disconnected somewhere within lighthead.	Check for torn, broken, or disconnected wiring within lighthead; also check for heat damage to lenses.	Replace any torn, broken, or disconnected wiring. Replace any damaged lenses. Refer to para 4.12.
		Fan assembly is malfunctioning.	Replace suspect fan assembly with known working fan assembly; also check for heat damaged lenses	Replace fan assembly. Refer to para 4-10. Replace any damaged lenses. Refer to para 4.14.

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
Adjustment lever(s) will not function.	Adjustment lever does not control brightness / beam size.	Iris diaphragm is malfunctioning.	Replace suspect iris diaphragm with known working iris diaphragm.	Replace iris diaphragm. Refer to para 4-13.
		Iris diaphragm is rotating in optic housing.	Check for loose screws holding optic housing to front cover.	Re-align iris diaphragm(s). Refer to para 4.13.
Arm assembly(ies) or lighthead does not rotate freely or drifts when released in desired position.	Down tube does not rotate or drifts when released in desired position.	Improper installation of ceiling plate (deflects too much or is not level).	Check for excessive flexing of ceiling support structure and / or check if ceiling plate is level.	Support ceiling structure as necessary to prevent flexing. If ceiling plate is not level, readjust until level.
	Cross tube rotates (at ball pivot joint) too stiffly or drifts when released in desired position.	Cross tube counterbalance needs to be adjusted.	Remove all tension from the ball pivot joint and observe to see if the cross tube counterbalances correctly.	Perform the cross tube counterbalance adjustment. Refer to para 4.15. Then, perform the ball pivot joint tension adjustment. Refer to para 4.16.
		Ball pivot joint tension needs to be adjusted.	Check ball pivot joint for looseness or stiffness.	Perform the cross tube counterbalance adjustment. Refer to para 4.15. Then, perform the ball pivot joint tension adjustment. Refer to para 4.16.
	Lamp tube does not rotate freely (at cross tube) or drifts when released in desired position.	Lamp tube brake tension needs to be adjusted.	Check for looseness or stiffness in joint.	Adjust the brake tension of the lamp tube. Refer to para 4.18.
	Lighthead does not rotate freely (at lamp tube) or drifts when released in desired position.	Lighthead brake tension needs to be adjusted.	Check for looseness or stiffness in joint.	Adjust the brake tension of the lighthead. Refer to para 4.19.
Arm assemblies can be rotated farther than specified.	Cross tube can be rotated more than 580° in one direction.	Ball pivot stop is broken.	Check for broken ball pivot stop.	Replace ball pivot stop. Refer to para 4.17.
	Lamp tube can be rotated more than 540° in one direction.	Lamp tube pivot stop is broken.	Check for broken lamp tube pivot stop.	Replace lamp tube pivot stop. Refer to para 4.22.
	Down tube can be rotated more than 580° in one direction.	Main pivot stop is broken.	Check for broken pivot stop.	Replace main pivot stop. Refer to para 4.21.
	Lighthead can be rotated more than 180° in one direction.	Lighthead pivot bearing stop is broken.	Check for broken lighthead pivot bearing.	Replace lighthead pivot bearing stop. Refer to para 4.20.
Lighthead will not operate properly.	Lighthead assembly illuminates, but not at the correct intensity.	Halogen bulb not illuminating at proper intensity.	Replace suspect halogen bulb with known working halogen bulb.	Replace halogen bulb. Refer to para 4.11.
		Wrong input tap is being used on transformer or facility voltage level has changed since lighting system was installed.	Check to see if correct transformer input tap is being used.	Select the proper transformer input tap based on the facility voltage available. Refer to para 4.5 ***or*** 4.6.
		Transformer is malfunctioning.	Replace suspect transformer with known working transformer.	Replace transformer. Refer to para 4.3 ***or*** 4.4.

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
Lighthead will not operate properly. - Continued	Lighthead assembly illuminates, but not at the correct intensity. - *Continued*	Bulb socket corroded resulting in bad connection or high resistance.	Clean bulb socket or replace suspect bulb socket with known working bulb socket.	Replace bulb socket. Refer to para 4.12.
		Lenses are clouded, dirty, or damaged.	Clean lenses or replace with new lens(es).	Replace lens(es). Refer to para 4.14.
		Components of lighthead have been damaged / abused to the point that the lighthead is no longer in tolerance.	—	Return lighthead to Midmark for repair. Call 1-800-MIDMARK and ask for Medical Products Technical Service.

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

SECTION II
TESTING AND TROUBLESHOOTING

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

SECTION III
SCHEDULED MAINTENANCE

3.1 Scheduled Maintenance

Table 3-1 is a Scheduled Maintenance Chart which lists the inspections and services that should be performed periodically on the 354 lighting system. These inspections and services should be performed as often as indicated in the chart.

Table 3-1. Scheduled Maintenance

Interval	Inspection or Service	What to Do
Semi-annually	Obvious damage	Visually check condition of lighting system for obvious damage such as: cracks in components, missing components, dents in components, or any other visible damage which would cause the lighting system to be unsafe to operate or would compromise its performance. Repair lighting system as necessary.
	Fasteners / hardware	Check lighting system for missing or loose fasteners / hardware. Replace any missing hardware and tighten any loose hardware as necessary.
	Warning and instructional decals	Check for missing or illegible decals. Replace decals as necessary.
	Ceiling support	Check the rigididity of the ceiling support to which the ceiling plate is secured to for stability and sturdiness. Strengthen supports if necessary and tighten any loose bolts. Check to see if the ceiling plate is level. If not, level the ceiling plate.
	Lighthead assembly	**CAUTION:** Use only a Quarternary / Ammonia - base Germicide type cleaner to clean / disinfect the light. Other cleaners could pit or cloud the plastic. For the housing portion of the lighthead, use a soap and water solution to remove dirt and stains; for tougher stains, a standard household cleaner may be used.
	Fan	**CAUTION:** Operating the lighthead without the fan in operation may cause heat damage to lenses. Check fan for proper operation. Verify that fan is operating when light is turned on. Replace fan assembly if necessary. Refer to para 4.10.
	ON / STANDBY switch	Check the ON / STANDBY switch for proper function. Replace ON / STANDBY switch if necessary. Refer to para 4.8.
	Integrity of wiring and / or connections	Move each axis thru its full range of motion while observing the light beam for intermittent flickering or light beam going out completely. Repair wiring or wiring connections as necessary.
	Rotation of all axis	Check each axis to ensure ease of movement and positioning with no drifting after being released. Adjust tension of brakes if drifting is observed. Make sure each axis cannot rotate more than is specified in Figure 2-1. If so, replace pivot stops / pivot bearing stops as necessary. Refer to para 4-17.
	Ball pivot joint	Check that cross tube can rotate +35° to -35°. Check for drifting of cross tube after it is released in a position. If necessary, adjust the ball pivot joint tension. Refer to para 4.16.
	Bulb	Check for a missing or burned out bulb. Replace bulb if necessary. Refer to para 4.11.
	Bulb socket	Check bulb socket for corrosion or damage which would prevent posts of bulb from making good electrical contact with bulb socket. Clean or replace bulb socket. Refer to para 4.12.
	Adjustment levers	Check levers for proper operation. Verify that levers adjust the brightness and beam size of the spotlight. Replace iris diaphragm(s) if necessary. Refer to para 4-13.
	Operational Test	Perform an Operational Test to determine if the exam light is operating within its specifications. Refer to para 2.1. Replace or adjust any malfunctioning components.

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

Return To Table Of Contents

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

SECTION IV
MAINTENANCE / SERVICE INSTRUCTIONS

4.1 Introduction

WARNING
Refer to the Operator Manual for complete instructions on operating the lighting system. Failure to do so could result in personal injury.

NOTE
Perform an operational test on the lighting system after the repair is completed to confirm the repair was properly made and that all malfunctions were repaired.

The following paragraphs contain removal, installation, repair, and adjustment procedures for the lighting system.

4.2 Typical Fuse Removal / Installation

A. Removal

WARNING
Always disconnect electrical power to the unit before removing any of the unit's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Turn the ON / STANDBY switch to STANDBY.

(2) Remove four screws (1, Figure 4-1) and lower ceiling cover (2) from ceiling plate (3)

(3) Simultaneously push in on fuse cap (4) with slotted screwdriver and rotate 1/4 turn in the counterclockwise direction; then pull fuse cap from fuse holder (5).

(4) Pull fuse (6) out of fuse cap (4).

(5) Inspect fuse for any indication it has been blown. Perform continuity check on fuse. Discard fuse.

B. Installation

(1) Insert one end of new fuse (6) into the fuse cap (4).

(2) Simultaneously push fuse cap (4) into fuse holder (5) and rotate it 1/4 turn in the clockwise direction to secure it.

(3) Install ceiling cover (2) on ceiling plate (3) and secure with four screws (1).

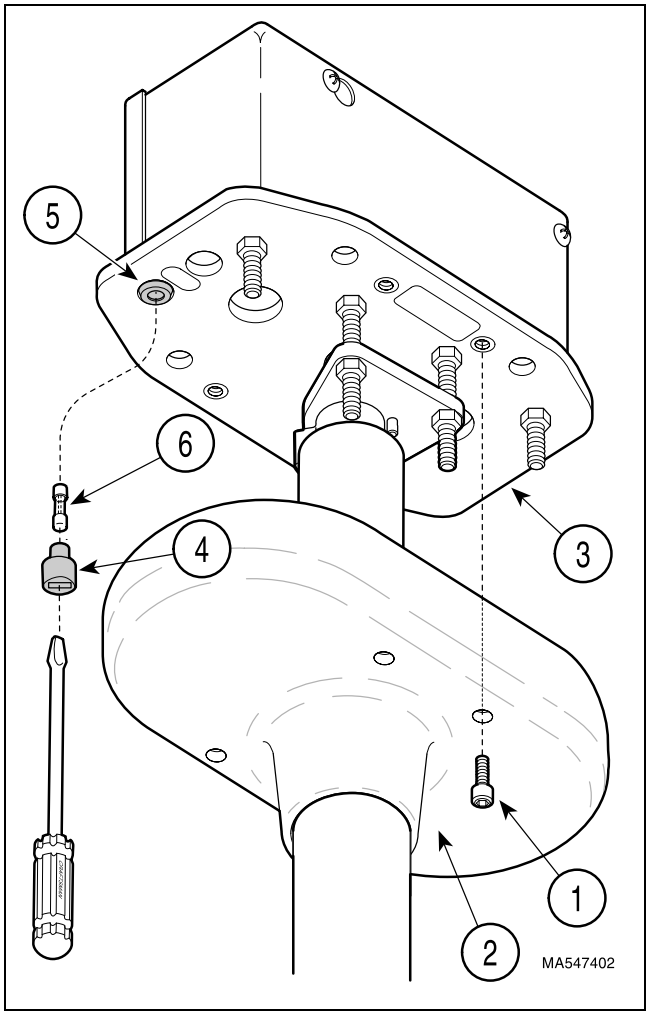


Figure 4-1. Fuse Replacement

SECTION IV
MAINTENANCE / SERVICE

4.3 Typical Transformer Removal / Installation *(Applies to all units with Serial Number prefixes KN, KP, KS, KT, LY, LZ, MA, MB, MD, and ME)*

A. Removal

WARNING
Always disconnect electrical power to the unit before removing any of the unit's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Turn off facility power breaker so there is no power in facility wiring.

NOTE
The following procedure is written for units with easy access thru ceiling to junction box. If your unit does not have easy access to junction box, removal of down tube and junction box may be necessary first.

(2) Loosen four screws (1, Figure 4-2); then remove junction box cover (2) from junction box (3) by lifting up and then outward.

(3) Tag and disconnect wire (4) from terminal of fuse holder (5).

NOTE
Only one of the transformer input wires are used (which one is used depends on facility input voltage). The following step applies to the input wire being used.

(4) Remove wire nut (6); then tag and disconnect yellow, orange, or red transformer input wire (7) from facility white "neutral" wire (8).

(5) Remove wire nuts (9) from remaining two input wires (7).

(6) Pull three wires (7) and wire (4) out thru snap bushing (10).

(7) Remove wire nuts (1, Figure 4-3); then tag and disconnect two wires (2) from two transformer output wires (3).

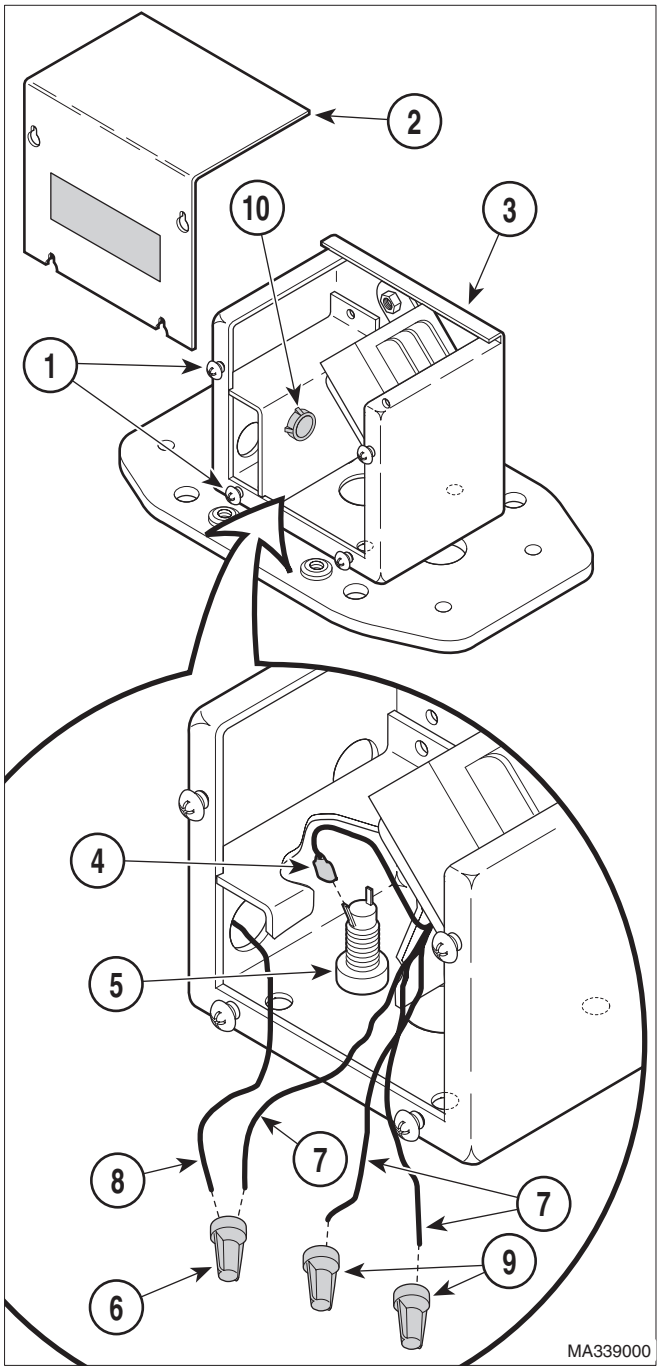


Figure 4-2. Transformer Access

(8) Remove two nuts (4), lockwashers (5), screws (6), and transformer (7) from junction box (8).

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

B. Installation

(1) Connect two transformer output wires (3, Figure 4-3) to two wires (2) (wires exiting from down tube) with two wire nuts (1). Secure wire nuts in place with electrical tape.

(2) Install transformer (7) on junction box (8) and secure with two screws (6), lockwashers (5), and nuts (4).

(3) Feed wire (4, Figure 4-2) and three wires (7) thru snap bushing (10).

NOTE
Make sure the same transformer input wire that was used on the old transformer is used on the new transformer. If necessary, perform transformer input tap selection (Refer to para 4.4).

(4) Connect transformer input wire (being used) (7) to facility white "neutral" wire (8) with large wire nut (6). Secure wire nut with electrical tape.

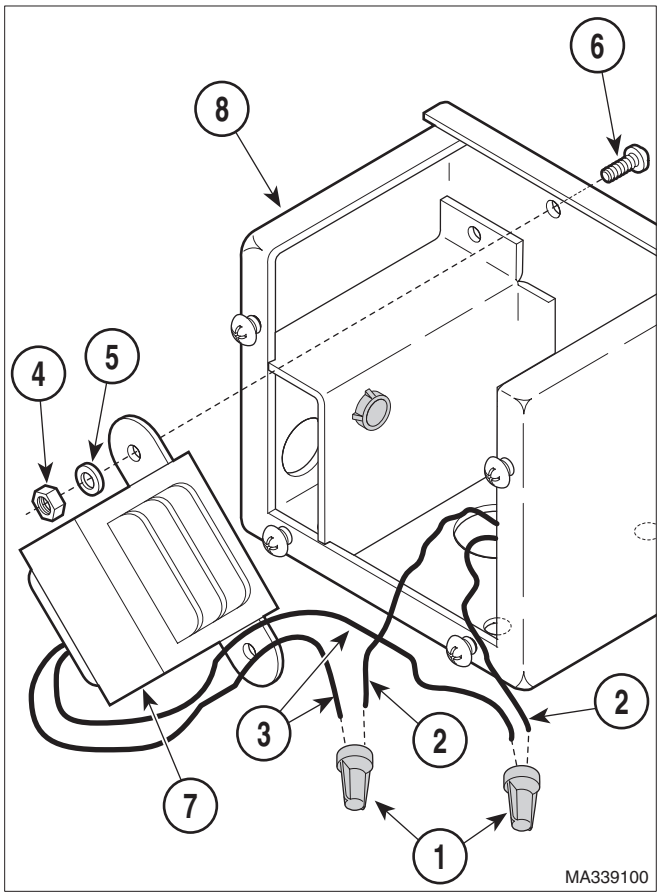


Figure 4-3. Transformer Removal / Installation

(5) Install small wire nuts (9) on the two remaining (unused) transformer input wires (7). Secure wire nuts with electrical tape.

(6) Connect wire (4) to terminal of fuse holder (5).

(7) Install junction box cover (2) on junction box (3) and secure by tightening four screws (1).

(8) Connect electrical power to unit.

4.4 Typical Transformer Removal / Installation *(Applies to units with Serial Numbers MX1000 & MZ1000 thru present)*

A. Removal

WARNING
Always disconnect electrical power to the unit before removing any of the unit's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Turn off facility power breaker so there is no power in facility wiring.

NOTE
The following procedure is written for units with easy access thru ceiling to junction box. If your unit does not have easy access to junction box, removal of down tube and junction box may be necessary first.

(2) Loosen four screws (1, Figure 4-2); then remove junction box cover (2) from junction box (3) by pulling outward.

(3) Tag and disconnect wire (4) from terminal of fuse holder (5).

NOTE
Only one of the transformer input wires are used (which one is used depends on facility input voltage). The following step applies to the input wire being used.

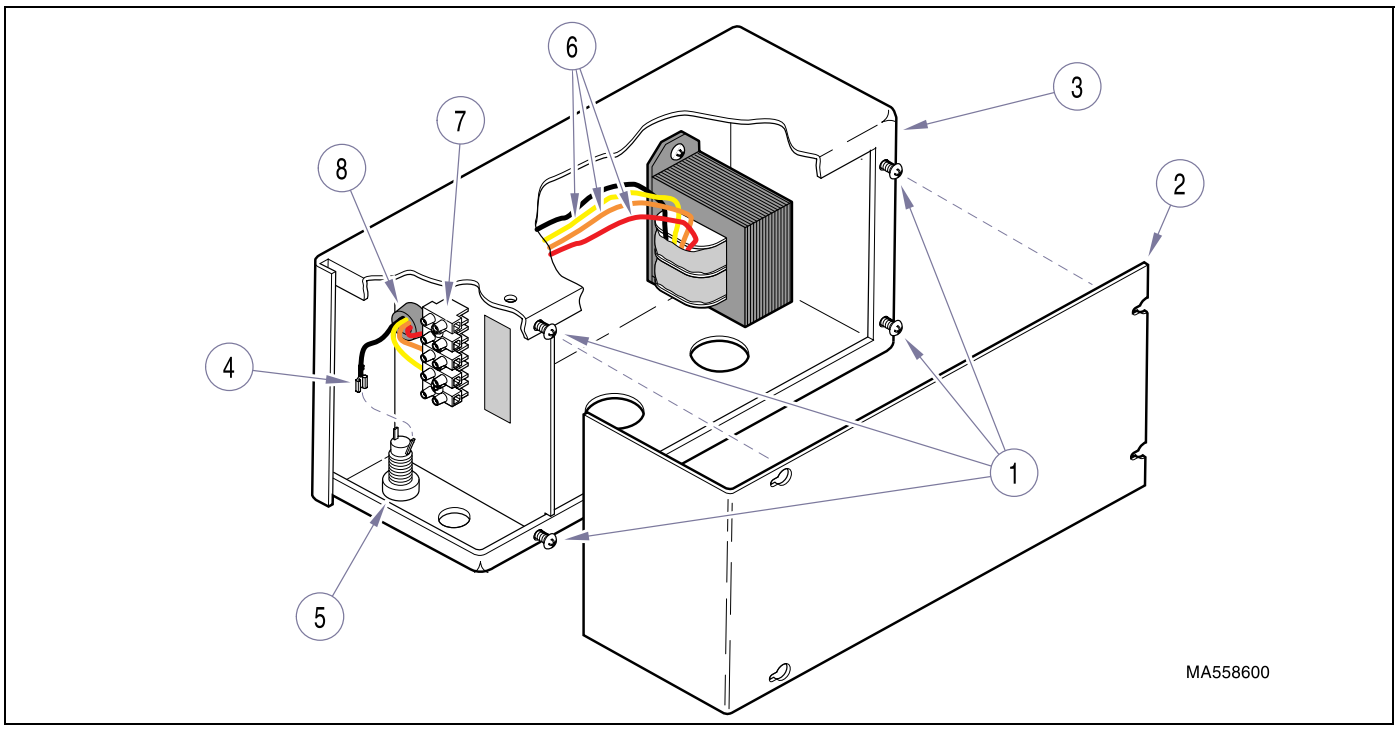


Figure 4-2. Transformer Access

(4) Tag and disconnect yellow, orange, or red transformer input wire (6) from facility terminal block (7).

(5) Pull three wires (6) and wire (4) out thru snap bushing (8).

(6) Disconnect blue and brown transformer output wires (1, Figure 4-3).

(7) Remove two screws (2), and transformer (3) from junction box (4).

B. Installation

(1) Connect blue and brown transformer output wires (1, Figure 4-3) to two wires (5) (wires exiting from down tube).

(2) Install transformer (3) on junction box (4) and secure with two screws (2).

(3) Feed one wire (4, Figure 4-2) and three wires (6) thru snap bushing (8).

(4) Connect yellow, orange, and red transformer input wires (6) to appropriately marked spot on the terminal block (7).

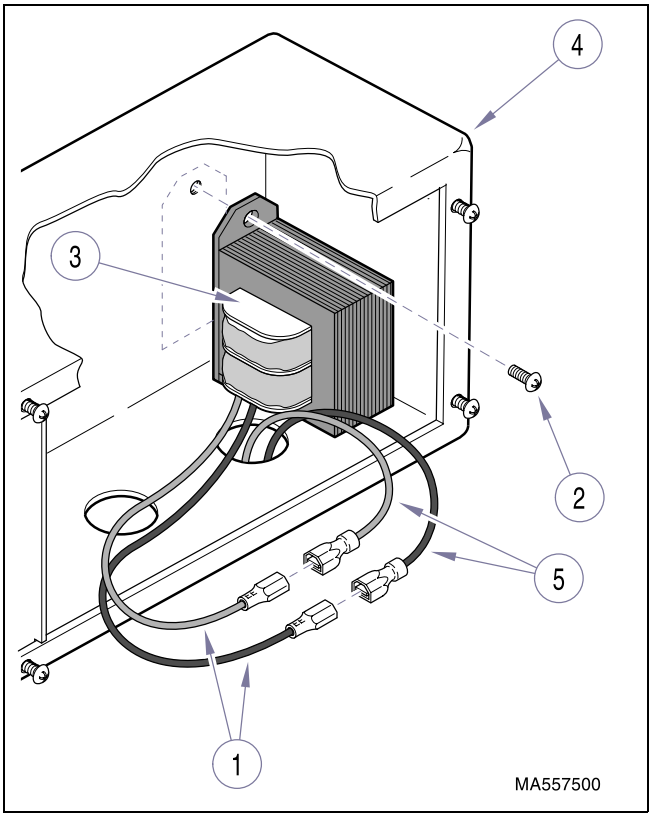


Figure 4-3. Transformer Removal / Installation

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

(5) Connect wire (4) to terminal of fuse holder (5).

(6) Install junction box cover (2) on junction box (3) and secure by tightening four screws (1).

(7) Connect electrical power to unit.

4.5 Transformer Input Tap Adjustment *(Applies to all units with Serial Number prefixes KN, KP, KS, KT, LY, LZ, MA, MB, MD, and ME)*

A. Removal

WARNING
Make sure facility supplied wiring is turned off for the following steps. Failure to do so could result in electrical shock causing serious personal injury or death.

(1) Turn off facility power breaker so there is no power in facility wiring to unit.

NOTE
The following procedure is written for units with easy access thru ceiling to junction box. If your unit does not have easy access to junction box, removal of down tube and then junction box may be necessary first.

(2) Loosen four screws (1, Figure 4-4); then remove junction box cover (2) from junction box (3) by lifting up and then outward.

(3) Remove wire nut (4); then tag and disconnect black “hot” wire (5) from fuse wire (6).

(4) Remove wire nut (7); then tag and disconnect white “neutral” wire (8) from yellow, orange, or red transformer input wire (9).

WARNING
Make sure facility supplied wiring is not shorted to junction box and do not touch wires during steps 5 and 6. Failure to do so could result in electrical shock causing serious personal injury or death.

(5) Turn on facility power breaker so there is power in facility wiring.

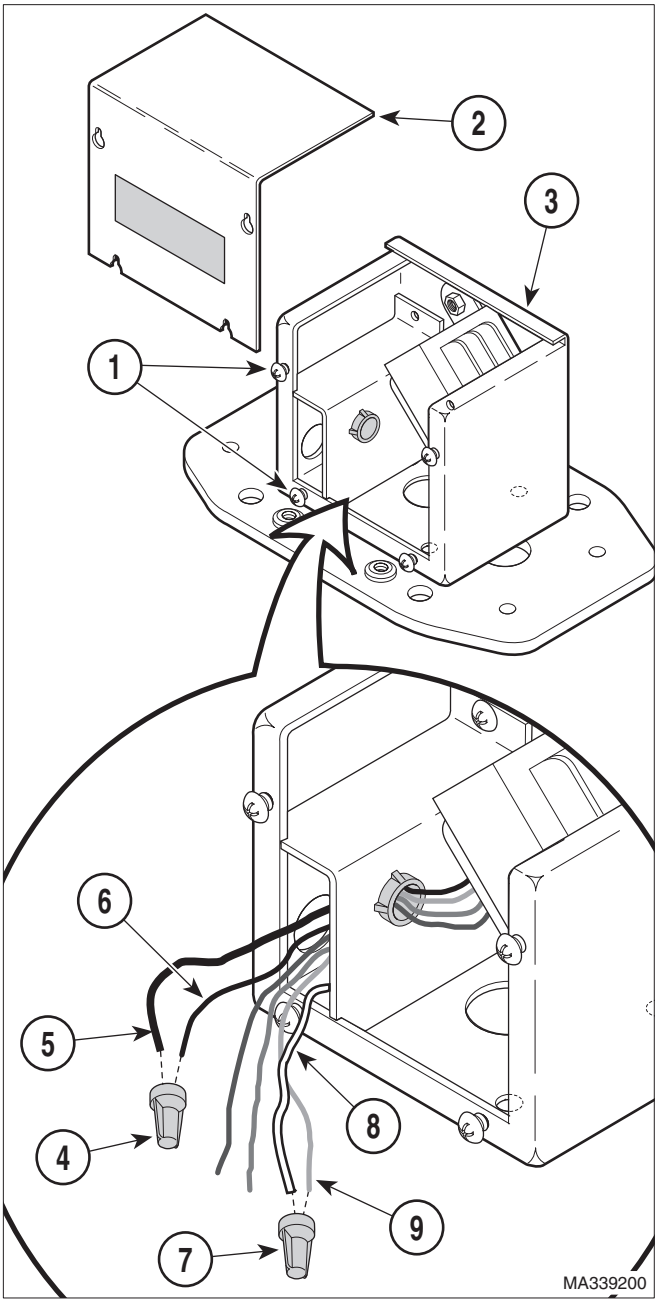


Figure 4-4. Transformer Input Tap Selection

(6) Using a multimeter, measure the input voltage between black “hot” wire (5) and white “neutral” wire (8) of facility wiring. Record this voltage.

(7) Turn off facility power breaker so there is no power in facility wiring to unit.

WARNING
Make sure facility supplied wiring is turned off for the following steps. Failure to do so could result in electrical shock causing serious personal injury or death.

NOTE
There are different levels of voltage at different facilities, however, the light is designed to work best at 120 VAC. The transformer has three input taps which can be used to adjust the transformer output based on what the facility input voltage actually is; whether it is too high, too low, or within tolerance. The following step helps select the correct input tap.

(8) If voltage measured in step 6 was 117.0 VAC or lower, connect the white "neutral" wire (8) of facility wiring to the yellow transformer input lead (9). Secure wires with large wire nut (7); then secure wire nut with electrical tape. If voltage measured in step 6 was between 117.1 and 123.0 VAC, connect the white "neutral" wire (8) of facility wiring to the orange transformer input lead (9). Secure with large wire nut (7); then secure wire nut with electrical tape. If voltage measured in step 6 was 123.1 VAC or higher, connect the white "neutral" wire (8) of facility wiring to the red transformer input lead (9). Secure wires with large wire nut (7); then secure wire nut with electrical tape.

(9) Connect the black "hot" wire (5) of facility wiring to fuse wire (6). Secure wires with large wire nut (4). Secure wire nut with electrical tape.

(10) Install junction box cover (2) on junction box (3) and secure by tightening four screws (1).

(11) Turn on facility power breaker so there is power to unit.

4.6 Transformer Input Tap Selection *(Applies to units with Serial Numbers MX1000 & MZ1000 thru present)*

A. Selection

WARNING
Make sure facility supplied wiring is turned off for the following steps. Failure to do so could result in electrical shock causing serious personal injury or death.

(1) Turn off facility power breaker so there is no power in facility wiring to unit.

NOTE
The following procedure is written for units with easy access thru ceiling to junction box. If your unit does not have easy access to junction box, removal of down tube and then junction box may be necessary first.

(2) Loosen four screws (1, Figure 4-4); then remove junction box cover (2) from junction box (3) by pulling outward.

WARNING
Make sure facility supplied wiring is not shorted to junction box and do not touch wires during steps 3 and 4. Failure to do so could result in electrical shock causing serious personal injury or death.

(3) Turn on facility power breaker so there is power in facility wiring.

(4) Using a multimeter, measure the input voltage between black "hot" wire (4) and white "neutral" wire (5) of facility wiring. Record this voltage.

(5) Turn off facility power breaker so there is no power in facility wiring to unit.

WARNING
Make sure facility supplied wiring is turned off for the following steps. Failure to do so could result in electrical shock causing serious personal injury or death.

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

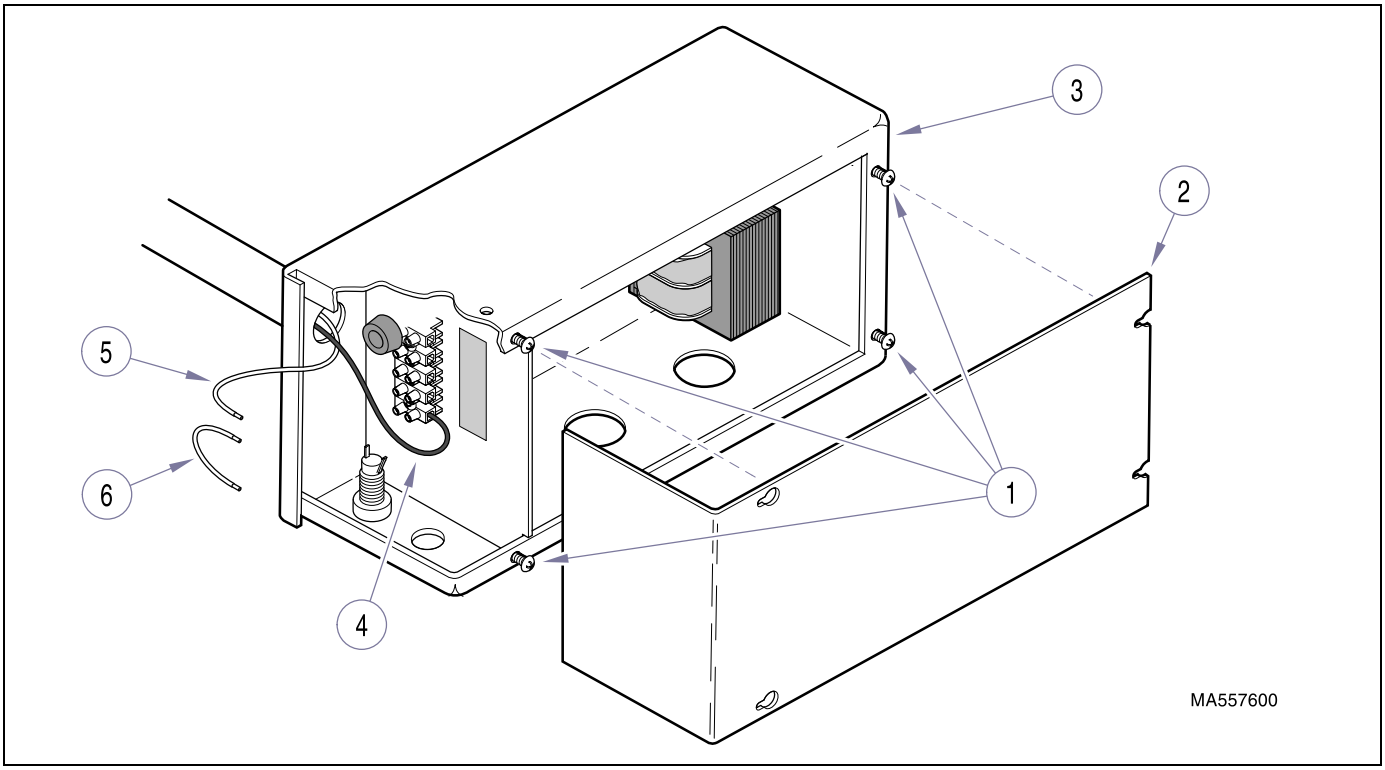


Figure 4-4. Transformer Input Tap Selection

NOTE
There are different levels of voltage at different facilities, however, the light is designed to work best at 120 VAC. The transformer has three input taps which can be used to adjust the transformer output based on what the facility input voltage actually is; whether it is too high, too low, or within tolerance. The following step helps select the correct input tap.

(6) If voltage measured in step 4 was **117.0 VAC or lower**, connect the white "neutral" wire (5) of facility wiring to terminal marked N/114V for Single Units or N1/114V or N2/114V for Double Units.
If voltage measured in step 4 was **between 117.1 and 123.0 VAC**, connect the white "neutral" wire (5) of facility wiring to the terminal marked N/120V for Single Units or N1/120V or N2/120V for Double Units.
If voltage measured in step 4 was **123.1 VAC or higher**, connect the white "neutral" wire (5) of facility wiring to the terminal marked N/126V for Single Units or N1/126V or N2/126V for Double Units.

(7) Connect the black "hot" wire (4) of facility wiring to the terminal marked "L".

(8) On Dual Light Units the white jumper wire (6) on the terminal block may need to be repositioned depending on the voltage measurement taken in step 4.
If voltage measured in step 4 was **117.0 VAC or lower**, connect the white jumper (6) to terminals N1/114V and N2/114V.
If voltage measured in step 4 was **between 117.1 and 123.0 VAC**, connect the white jumper (6) to terminals N1/120V and N2/120V.
If voltage measured in step 4 was **123.1 VAC or higher**, connect the white jumper (6) to terminals N1/126V and N2/126V.

(9) Install junction box cover (2) on junction box (3) and secure by tightening four screws (1).

(10) Turn on facility power breaker so there is power to unit.

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

SECTION IV
MAINTENANCE / SERVICE

4.7 Typical Fuse Holder Removal / Installation

A. Removal

WARNING
Always disconnect electrical power to the unit before removing any of the unit's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Turn off facility power breaker so there is no power in facility wiring to unit.

(2) Remove four screws (1, Figure 4-5) and lower ceiling cover (2) from ceiling plate (3).

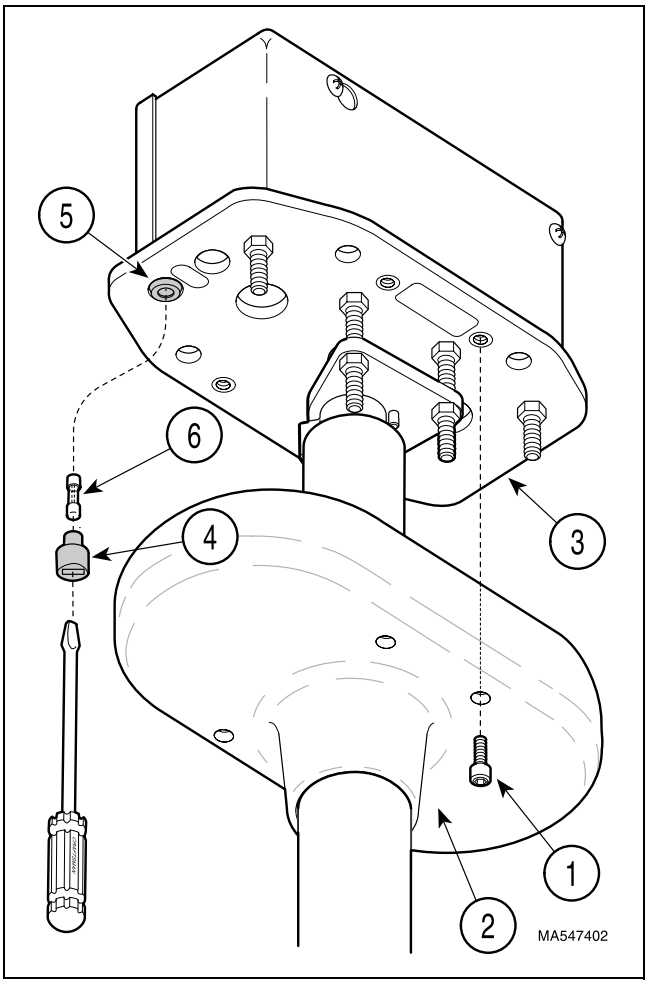


Figure 4-5. Ceiling Cover / Fuse Removal / Installation

(3) Simultaneously push in on fuse cap (4) with a slotted screwdriver and rotate it 1/4 turn in the counterclockwise direction; then pull fuse cap from fuse holder (5).

(4) Pull fuse (6) out of fuse cap (4).

NOTE
The following procedure is written for units with easy access thru ceiling to junction box. If your unit does not have easy access to junction box, removal of down tube and junction box may be necessary first.

(5) Loosen four screws (1, Figure 4-6); then remove junction box cover (2) from junction box (3) by pulling outward.

NOTE
For units with older style junction box (not shown), it will be necessary to remove two screws and partially separate junction box divider to access fuse holder.

(6) Disconnect two wires (4) from terminal of fuse holder (5).

(7) Remove nut (6) and push fuse holder (5) down thru ceiling plate (7).

B. Installation

(1) Push fuse holder (5) up thru ceiling plate (7) and secure with nut (6).

(2) Connect two wires (4) to terminals of fuse holder (5).

(3) Install junction box cover (2) on junction box (3) and secure by tightening four screws (1).

(4) Insert one end of fuse (6, Figure 4-5) into fuse cap (4).

(5) Simultaneously push fuse cap (4) into fuse holder (5) and rotate it 1/4 turn in clockwise direction to secure it.

(6) Install ceiling cover (2) on ceiling plate (3) and secure with four screws (1).

(7) Turn on facility power breaker so there is power in facility wiring to unit.

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

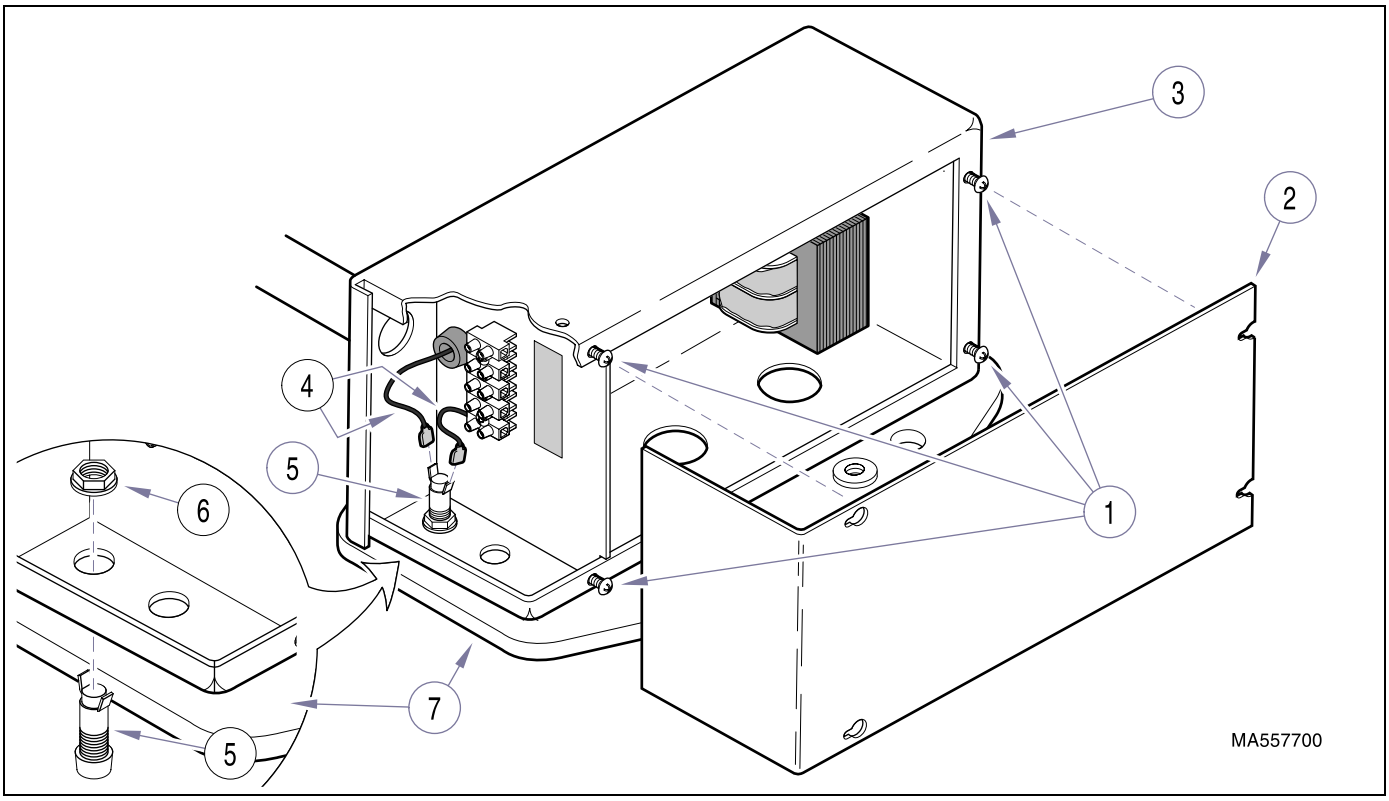


Figure 4-6. Fuse Holder Removal / Installation

4.8 ON / STANDBY Switch Removal / Installation

A. Removal

WARNING
Always disconnect electrical power to the unit before removing any of the unit's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Disconnect electrical power to unit.

(2) Remove two screws (1, Figure 4-7) and partially separate switch bezel (2) from cross tube weldment (3).

(3) Disconnect two wires (4) from terminals of ON / STANDBY switch (5).

(4) While simultaneously pressing on four locking tabs, push ON / STANDBY switch (5) out of switch bezel (2).

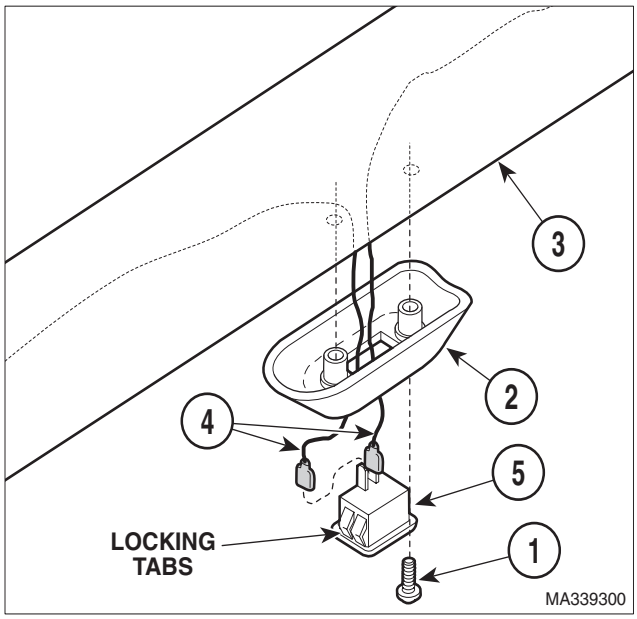


Figure 4-7. ON / STANDBY Switch Removal / Installation

B. Installation

(1) Press ON / STANDBY switch (5) into switch bezel (2) until it pops into place.

(2) Position ON / STANDBY switch (5) so the ON label "I" is located toward the ball pivot.

(3) Connect two wires (4) to terminals of ON / STANDBY switch (5).

(4) Install switch bezel (2) on cross tube weldment (3) and secure with two screws (1).

(5) Connect electrical power to unit.

4.9 Lighthead Removal / Installation

A. Removal

WARNING
Always disconnect electrical power to the unit before removing any of the unit's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Disconnect electrical power to unit.

(2) Remove two screws (1, Figure 4-8) and separate lighthead (2) from lamp tube (3).

(3) Disconnect two wires (4) from bulb socket wires (5). Remove lighthead (2).

B. Installation

(1) Position lighthead (2) near lamp tube (3); then connect two bulb socket wires (5) to wires (4).

WARNING
Make sure screws (1) are installed correctly. Failure to install screws correctly could allow lighthead to fall resulting in patient or staff injury.

(2) Install lighthead (2) on lamp tube (3) and secure with two screws (1)..

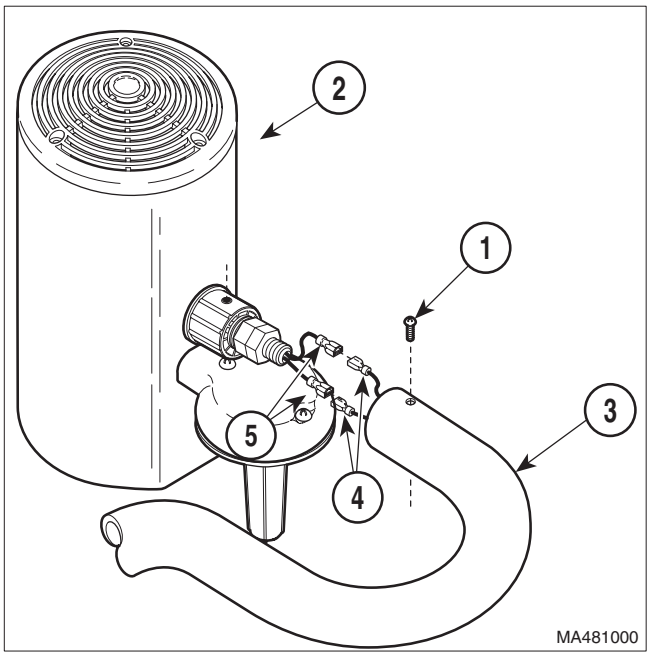


Figure 4-8. Lighthead Removal / Installation

4.10 Fan Assembly Removal / Installation

A. Removal

WARNING
Always disconnect electrical power to the unit before removing any of the unit's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Disconnect electrical power to unit.

(2) Remove screw (1, Figure 4-9) and slide bulb carriage (2) out of housing assembly (3).

(3) Remove two screws (4) and top cap (5) from bulb carriage (2).

(4) Remove four screws (6), nuts (7) and partially separate fan assembly (8) from bulb carriage (2).

(5) Cut wire tie (9) and remove nut (10).

(6) Remove two wire nuts (11) and fan assembly (8) from bulb carriage (2).

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

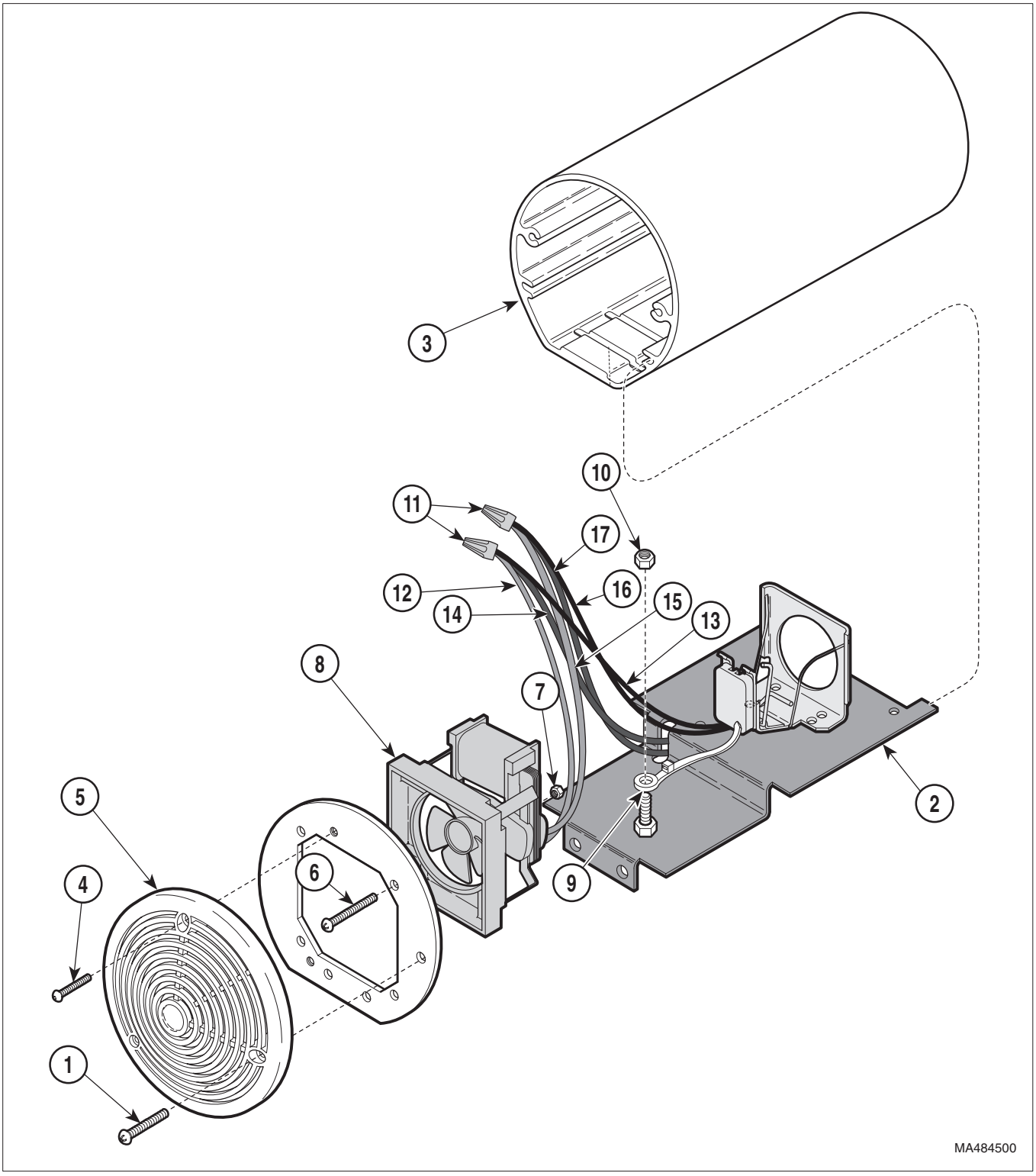


Figure 4-9. Fan Assembly Removal / Installation

B. Installation

(1) Connect fan wire (12) to bulb socket wire (13) and power wire (14); then connect fan wire (15) to bulb socket wire (16) and power wire (17); secure connections with two wire nuts (11). Secure wire nuts with electrical tape.

(2) Gather wires with wire tie (9); then secure wire tie to bulb carriage (2) with nut (10).

(3) Install fan assembly (8) and secure to bulb carriage (2) with four screws (6) and nuts (7).

(4) Secure top cap (5) to bulb carriage (3) with two screws (4).

(5) Slide bulb carriage (2) into housing (3) and secure with screw (1).

4.11 Bulb Removal / Installation

A. Removal

WARNING
Always disconnect electrical power to the unit before removing any of the unit's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Disconnect electrical power to unit.

NOTE
Screw (1) is a captive screw. Only loosen captive screw; do not try to remove it.

The phillips head screw (1) is different from the other two screws on the top cap. Loosen this screw only to slide out the bulb carriage assembly (2); the other two screws secure the top cap to the fan mounting plate.

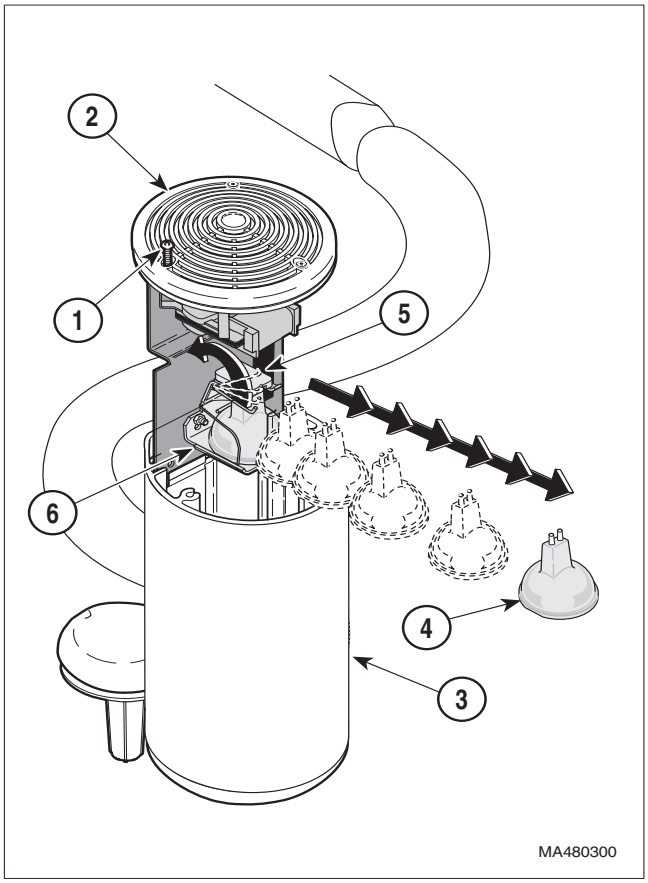


Figure 4-10. Bulb Removal / Installation

(2) Loosen screw (1, Figure 4-10) and slide bulb carriage (2) out of outer housing (3).

CAUTION
Bulb may be HOT! Allow bulb to cool for 4-5 minutes before attempting to remove. Otherwise, burns to the hands and fingers could result.

NOTE
Halogen bulbs are sensitive to body oils. Be sure not to touch the inside face of the reflector or glass capsule of the bulb during relamping or cleaning. Body oils create a hot spot on the bulb and may cause the bulb to burn out prematurely. If these portions of the bulb / reflector are handled, wipe with a clean, soft, lint free cloth. Wipe with alcohol and pat dry.

(3) Remove bulb (4) by pulling bulb ejector lever (5) to the rear and then gently pulling up on bulb.

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

B. Installation

(1) Push bulb ejector lever (5) forward.

WARNING
The maximum allowable bulb wattage which can be used in this light is 150 Watts. There is a risk of fire if the 150 Watt limit is exceeded.
Use Midmark Part Number: 015-1212-00.

NOTE
Halogen bulbs are sensitive to body oils. Be sure not to touch the inside face of the reflector or glass capsule of the bulb during relamping or cleaning. Body oils create a hot spot on the bulb and may cause the bulb to burn out prematurely. If these portions of the bulb / reflector are handled, wipe with a clean, soft, lint free cloth. Wipe with alcohol and pat dry.

(2) Insert bulb (4) into bulb socket (6) and push down until the base of the bulb is firmly seated against the bulb socket.

(3) Slide bulb carriage assembly (2) into outer housing (3) and secure by tightening screw (1).

4.12 Bulb Socket Removal / Installation

A. Removal

WARNING
Always disconnect electrical power to the unit before removing any of the unit's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Disconnect electrical power to unit.

(2) Remove bulb. (Refer to para 4.9).

(3) Partially remove fan assembly. (Refer to Removal, steps 3 & 4 of para 4.8).

(4) Cut wire tie (1, Figure 4-11) and remove nut (2).

(5) Remove two screws (3) and nuts (4).

(6) Remove two wire caps (5) and bulb socket (6) from bulb carriage (7).

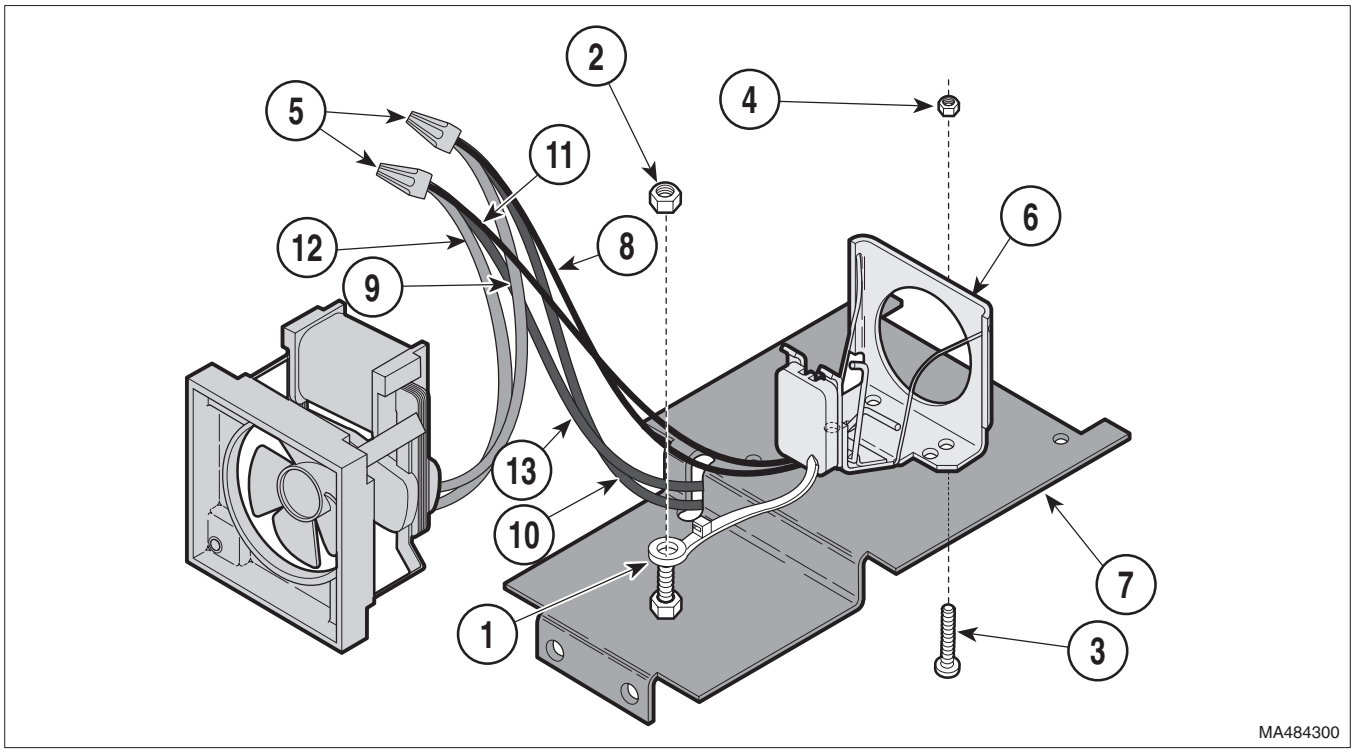


Figure 4-11. Bulb Socket Removal / Installation

B. Installation

(1) Secure bulb socket (6) to bulb carriage (7) with two screws (3) and nuts (4).

(2) Connect bulb socket wire (8) to fan wire (9) and power wire (10); then connect bulb socket wire (11) to fan wire (12) and power wire (13); secure connections with two wire caps (5). Secure wire caps with electrical tape.

(3) Secure all wires with wire tie (1); then secure wire tie to bulb carriage (7) with nut (2).

(4) Install fan assembly. (Refer to Installation, steps 3 & 4 of para 4.8).

(5) Install bulb. (Refer to para 4.9).

4.13 Iris Diaphragm Removal / Installation

A. Removal

WARNING
Always disconnect electrical power to the unit before removing any of the unit's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Disconnect electrical power to unit.

(2) Remove two adjustment levers (1, Figure 4-12) by turning counterclockwise.

(3) Remove two screws (2) and optic assembly (3) from housing (4).

EQUIPMENT ALERT
After removing, place optic assembly (3, Figure 4-12) on a flat surface, front cover (5) down to avoid damage to lenses or cover glass.

(4) Remove three screws (1, Figure 4-13), three washers (2), screen (3) and retaining disk (4).

(5) Remove cover glass (5) and O-ring (6).

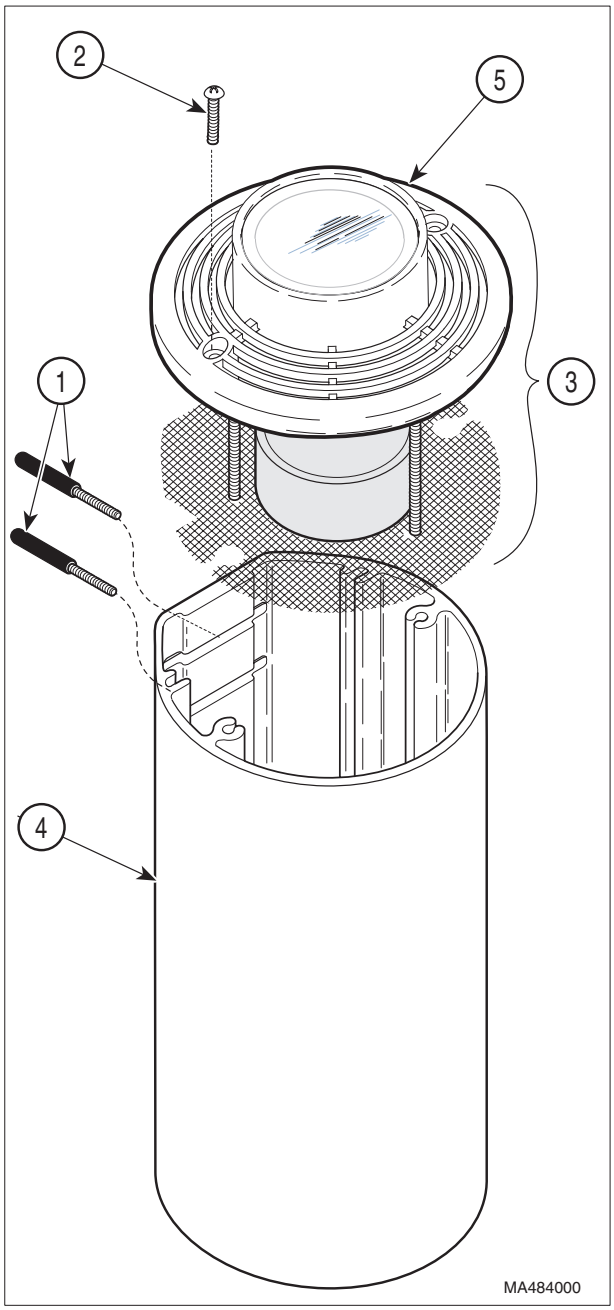


Figure 4-12. Optic Assembly Removal / Installation

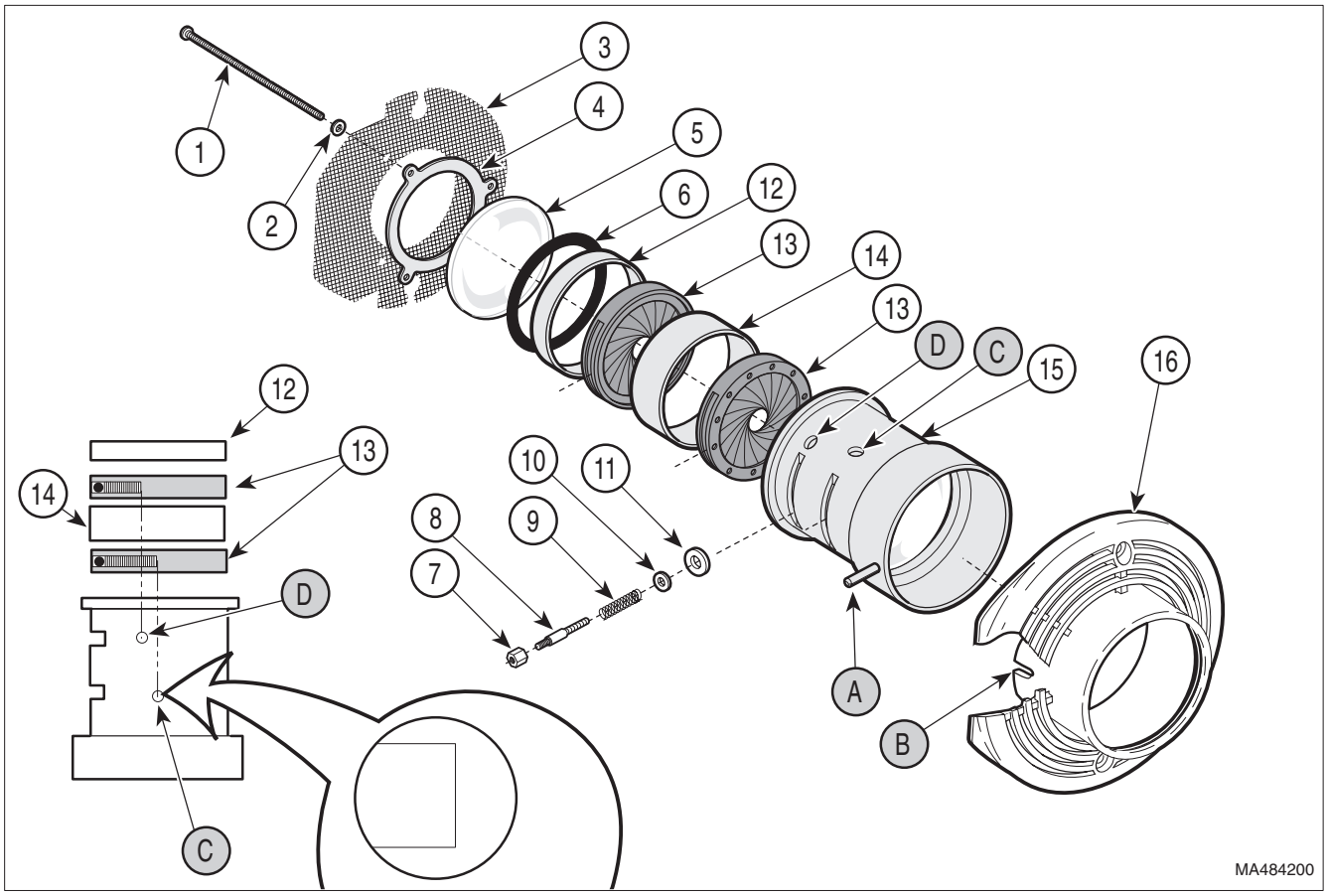


Figure 4-13. Iris Diaphragm Removal / Installation

(6) Remove hex nut (7), iris lever shank (8), spring (9), washer (10) and washer (11).

NOTE
To ease removal of spacers and iris diaphragms, cover the top of the optic housing (15) with a soft clean cloth and gently turn housing upside down.

(7) Remove cover spacer (12), iris diaphragm (13), iris spacer (14) and iris diaphragm (13) from optic housing (15).

B. Installation

(1) Place optic housing (15) onto front cover positioning optic housing roll pin (A) in front cover notch (B).

NOTE
When installing, be sure the threaded holes in the iris diaphragms (13) align with the slots in the optic housing (15).

(2) Install first iris diaphragm (13) into optic housing (15) with the flat side downward. Rotate so that the edge of the iris diaphragm slot is centered in the aligning hole (C) of the optic housing (15).

(3) Install iris spacer (14) in optic housing (15).

(4) Install second iris diaphragm (13) into optic housing (15) with the flat side upward. Rotate so that the edge of the iris diaphragm slot is centered in the aligning hole (D) of the optic housing (15). Make certain that the first iris diaphragm did not move out of position.

(5) Install cover spacer (12), O-ring (6) and cover glass (5).

EQUIPMENT ALERT
Tighten screws (1) until the tabs of the retaining disk (4) deflect *slightly.* Overtightening could cause cover glass to break.

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

NOTE
Before tightening screws (1), verify that the edges of the iris diaphragm slots are still centered in the aligning holes (C & D) of the optic housing (15).

(6) Install retaining disk (4), screen (3) and secure with washers (2) and screws (1).

EQUIPMENT ALERT
When installing iris lever shanks (8), hand tighten only. Over-tightening could strip threads.

(7) Slide spring (9), washer (10) and washer (11) on iris lever shank (8); then insert thru slot in optic housing (15) and turn clockwise into threaded hole of iris diaphragm (13).

(8) Thread hex nut (7) onto iris lever shank (8) hand tightening only.

(9) Slide optic assembly (3, Figure, 4-12) into housing (4) and secure with two screws (2).

EQUIPMENT ALERT
When installing adjustment levers (1), hand tighten only. Over-tightening could strip threads.

(10) Install two adjustment levers (1) thru slots in housing (4) and secure to hex nut (7, Figure 4-13) by turning clockwise.

4.14 Lens Removal / Installation

A. Removal

WARNING
Always disconnect electrical power to the unit before removing any of the unit's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Disconnect electrical power to unit.

(2) Remove two adjustment levers (1, Figure 4-14) by turning counterclockwise.

EQUIPMENT ALERT
After removing, place optic assembly (3) on a flat surface, front cover down to avoid damage to lenses or cover glass.

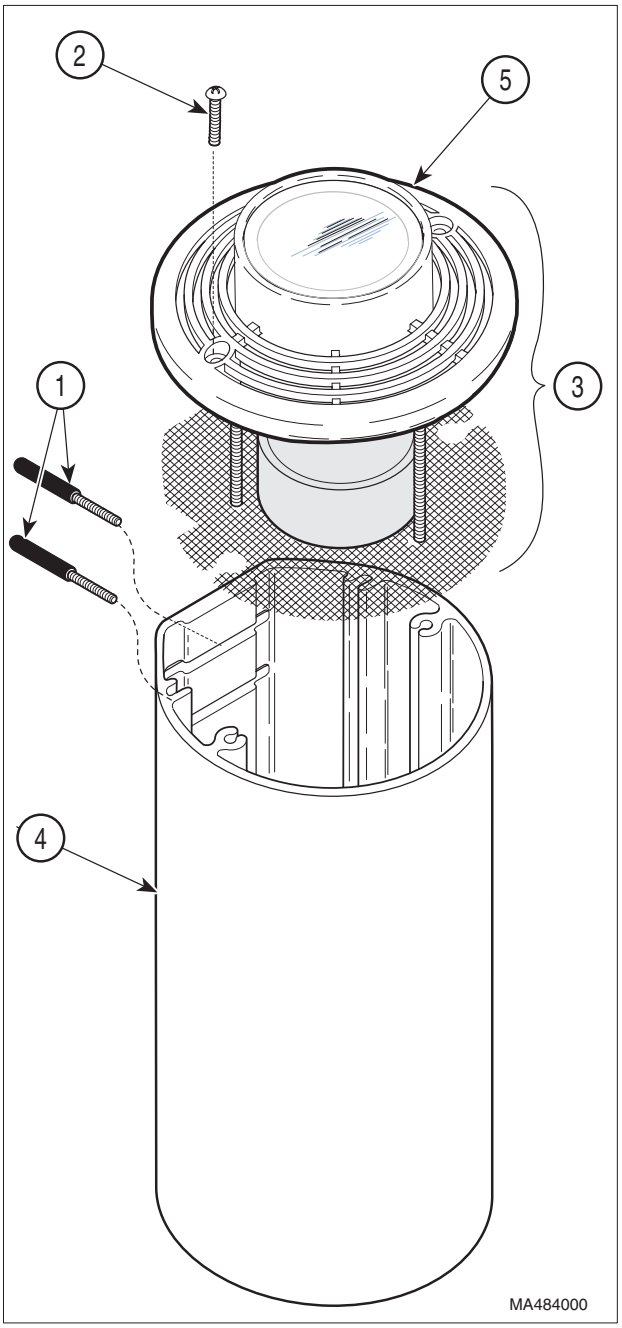


Figure 4-14. Optic Assembly Removal / Installation

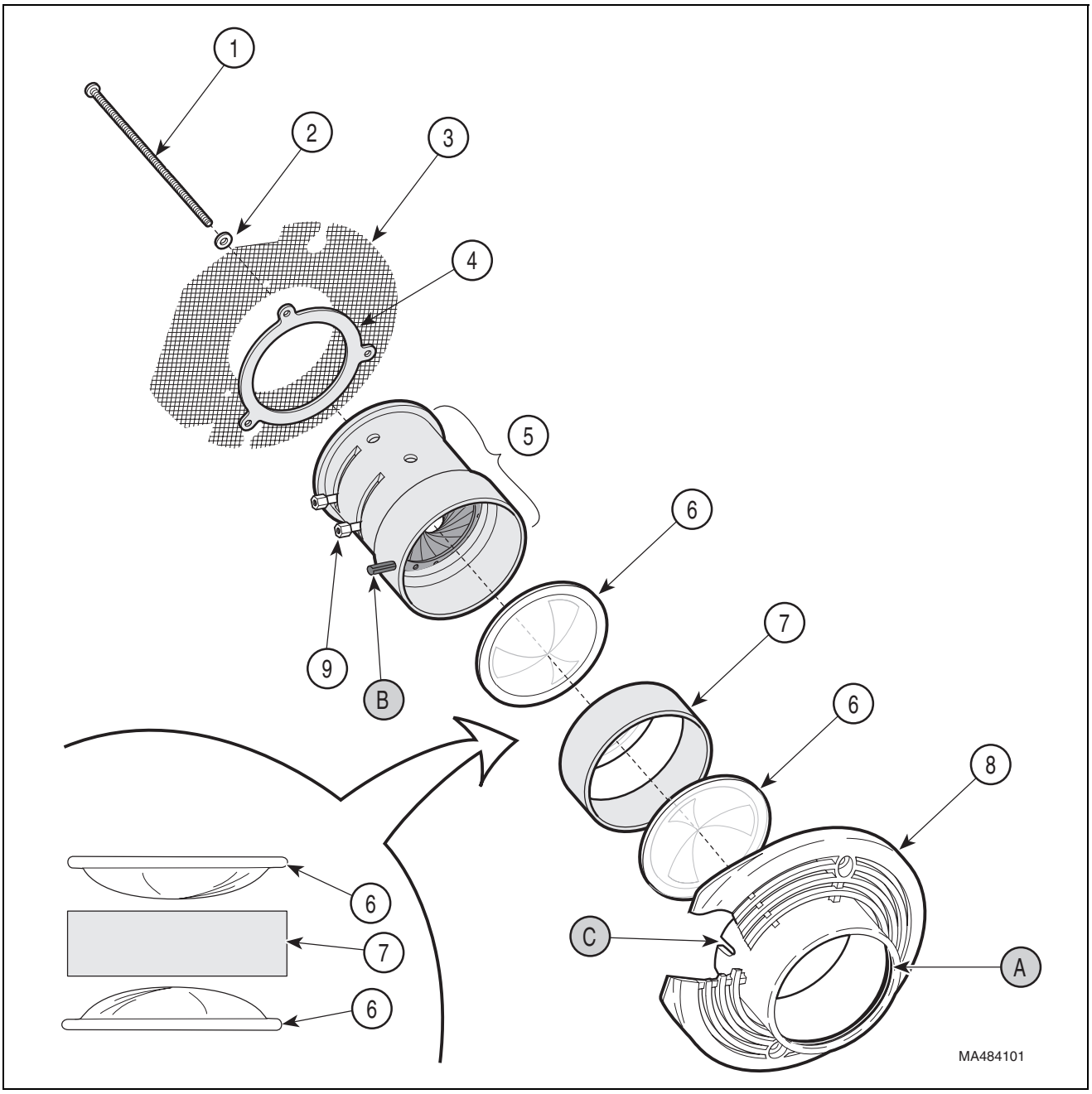


Figure 4-15. Lens Removal / Installation

(3) Remove two screws (2) and optic assembly (3) from housing (4).

(4) Remove three screws (1, Figure 4-15), washers (2), screen (3) and retaining disk (4).

NOTE
When removing the optic housing (2), be careful so as not to displace the two iris diaphragms located inside of the optic housing.

(5) Remove optic housing (5).

NOTE
To ease removal of two lenses (6) and spacer (7), cover the back of the front cover (8) with a soft clean cloth and gently turn front cover upside down.

(6) Remove lens (6), lens spacer (7) and lens (6) from front cover (8).

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

B. Installation

NOTE
Verify that the O-ring (A, Figure 4-15) in the lip of the front cover (8) is in place and intact. If it is not, replace O-ring.

(1) Install lens (6), lens spacer (7) and lens (6) in front cover (8).

(2) Place optic housing (5) onto front cover (8) positioning optic housing roll pin (B) in front cover notch (C).

EQUIPMENT ALERT
Tighten screws (1) until the tabs of the retaining disk (4) deflect *slightly.* Over-tightening could cause cover glass to break.

NOTE
Be sure iris diaphragms are in position before tightening screws (1). (Refer to Installation, steps 2 thru 4 of para 4.11).

(3) Install retaining disk (4), screen (3) and secure with three washers (2) and screws (1).

(4) Slide optic assembly (3, Figure 4-14) into housing (4) and secure with two screws (2).

EQUIPMENT ALERT
When installing adjustment levers (1), hand tighten only. Over-tightening could strip threads.

(5) Install two adjustment levers (1) thru slots in housing (4) and secure to hex nuts (9, Figure 4-15) by turning clockwise.

4.15 Cross Tube Counterbalance Adjustment

A. Adjustment

(1) Remove screw (1, Figure 4-16) and slide ball pivot sleeve (2) up out of way.

(2) Rotate cross tube (3) until adjustment hole (4) appears in the adjustment window opening.

(3) Insert screwdriver into adjustment hole (4) and rotate ball pivot cam (5) to assembly / disassembly position.

(4) Remove screw (1, Figure 4-17) and housing cap (2) from ballast housing (3).

(5) Adjust screw (4) until cross tube balances in a horizontal position.

(6) Install housing cap (2) on balast housing (3) and secure with screw (1).

NOTE
Factory recommendation: Start wth the light setting and then proceed to the medium or stiff setting only if necessary to prevent drifting.

(7) Insert screwdriver into adjustment hole (4, Figure 4-16) and rotate ball pivot cam (5) to the desired setting.

NOTE
One way to determine if cross tube is balanced properly is to raise the cross tube above horizontal, release it and observe where it stops. Then, lower the cross tube below horizontal plane, release it and observe where it stops. The cross tube should return to the horizontal position and remain there; if it does, the cross tube counterbalance is adjusted properly. Turning screw (4) in clockwise direction will raise lighthead end of cross tube. Turning screw (4) in counterclockwise direction will lower the lighthead end of cross tube.

(8) Slide ball pivot sleeve (2) down into position and secure with screw (1).

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

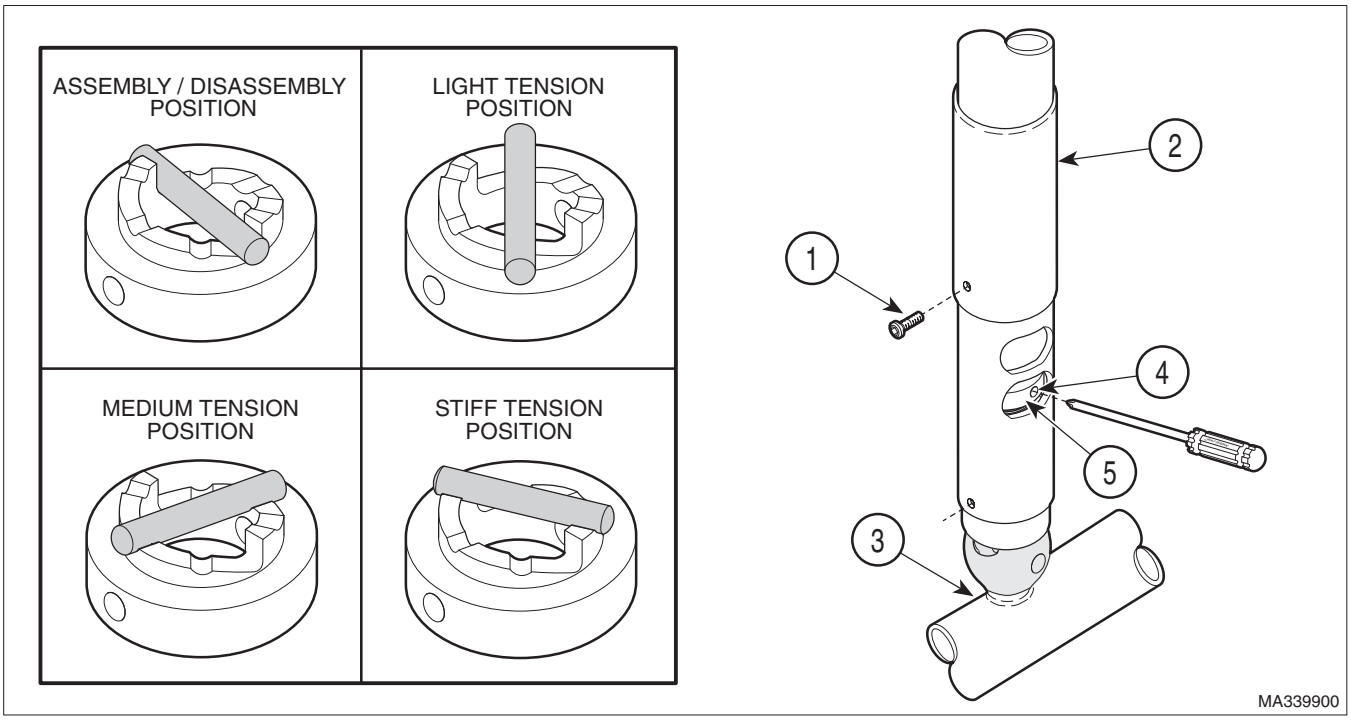


Figure 4-16. Tension Release

4.16 Ball Pivot Joint Tension Adjustment

A. Adjustment

(1) Remove screw (1, Figure 4-16) and slide ball pivot sleeve (2) up out of way.

(2) Rotate cross tube (3) until adjustment hole (4) appears in adjustment window opening.

NOTE
There are three settings to which the ball pivot cam (5) can be set: light tension, medium tension, or stiff tension (see Figure 4-16). These settings may be changed according to the operator's preference.

(3) Insert screwdriver into adjustment hole (4). Then, using screwdriver, rotate ball pivot cam (5) to the desired tension setting.

(4) Remove screwdriver and move cross tube (3) about the ball pivot joint in a circular motion and up and down motion to ensure the setting is the one desired. Move cross tube (3) to a non-horizontal position and release it. The cross tube should not drift in any direction. If it does, a higher tension setting is required.

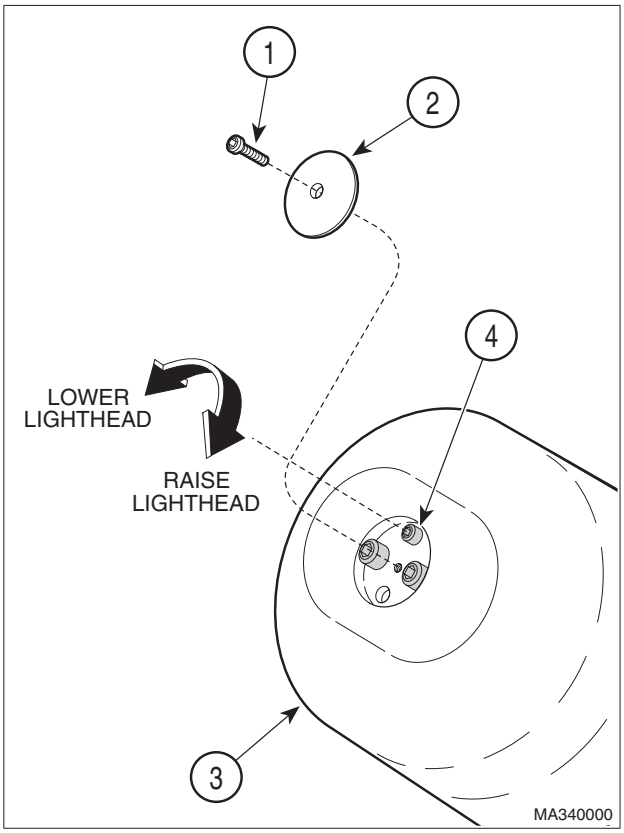


Figure 4-17. Cross Tube Counterbalance

(5) Repeat steps 3 and 4 until the desired tension adjustment is achieved with no drifting of cross tube. If a satisfactory tension adjustment cannot be achieved, perform cross tube counterbalance adjustment procedure (refer to para 4.13) and then repeat ball pivot joint tension adjustment procedure.

(6) Slide ball pivot sleeve (2) down into position and secure with screw (1).

4.17 Ball Pivot and / or Ball Pivot Stop Removal / Installation

A. Removal

WARNING
Always disconnect electrical power to the unit before removing any of the unit's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Disconnect electrical power to unit.

(2) Remove screw (1, Figure 4-18) and slide ball pivot sleeve (2) up out of way.

(3) Disconnect two wires (3) from two wires (4).

CAUTION
The cross tube / lighthead is very heavy. You may need to use an assistant. Use proper lifting techniques to prevent injury or back strain.

(4) While supporting cross tube / lighthead (5), remove two screws (6) and then cross tube / lighthead from down tube (7).

NOTE
Ball pivot joint will not have any tension on it at all if ball pivot cam is in proper position.

(5) Insert a screwdriver or punch into adjustment hole (8) and rotate ball pivot cam to "Assembly / Disassembly" position.

(6) Cut quick disconnect terminals (9) from two wires (3), making sure to cut as close to terminals as possible to preserve wire length.

(7) Using a hammer and punch, drive out groove pin (10) and remove ball pivot assembly (11) from cross tube (5).

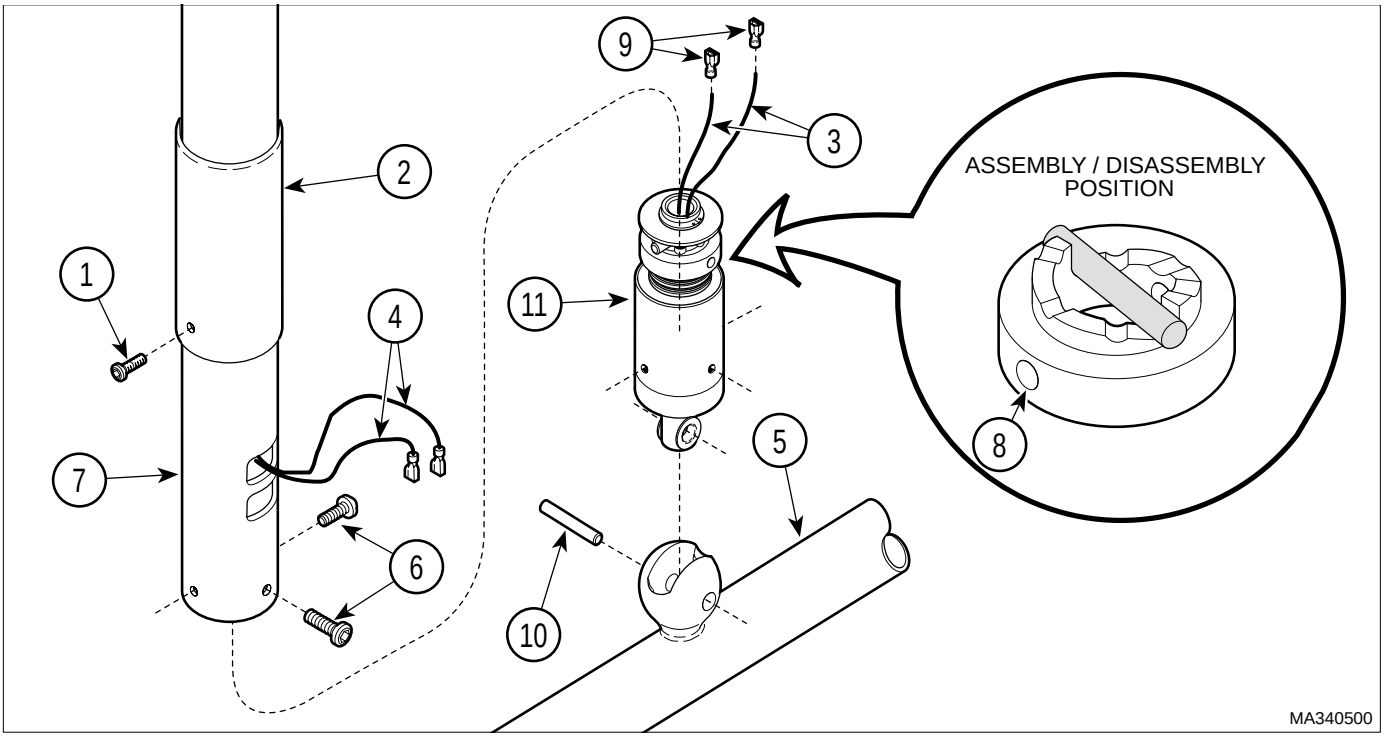


Figure 4-18. Ball Pivot Removal / Installation

B. Disassembly

(1) Using retaining ring pliers, remove retaining ring (1, Figure 4-19) and washer (2) from ball pivot shaft (3).

NOTE
There are serrations on one end of groove pin (4). Drive groove pin so serrations do not go thru ball pivot shaft.

(2) Using a hammer and punch, drive groove pin (4) out of ball pivot shaft (3).

(3) Remove ball pivot cam (5), three wave washers (6), washer (7), two wave washers (8), thrust washer (9), washer (10), and ball pivot bearing (11) from ball pivot shaft (3).

NOTE
If it is necessary to remove the ball pivot stop, perform remaining steps.
One method of removing flange bearings is to use vise grips to rotate flange bearings and loosen them; then use a screwdriver to pry them out.

(4) Remove two flange bearings (1, Figure 4-20) from ball pivot shaft (2).

(5) Remove ball pivot brake (3), ball pivot housing (4), and ball pivot stop (5) from ball pivot shaft (2).

(6) If broken, remove groove pin (6).

C. Assembly

NOTE
New groove pins should be used anytime they are removed.

(1) If removed, install groove pin (6, Figure 4-20).

NOTE
To install correctly, make sure raised portion of ball pivot stop (5) is facing toward top of ball pivot shaft (2). Also, make sure the concave of ball pivot brake (3) faces the ball pivot.

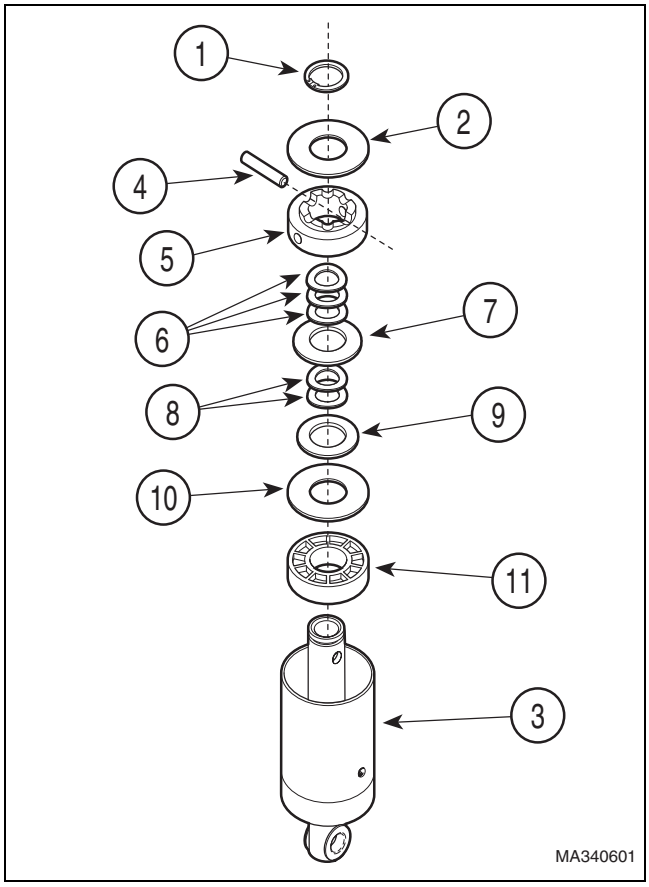


Figure 4-19. Ball Pivot Disassembly / Assembly

(2) Install ball pivot stop (5), ball pivot housing (4), and ball pivot brake (3) on ball pivot shaft (2).

(3) Install two flange bearings (1) on ball pivot shaft (2).

NOTE
To install correctly, make sure teflon side of thrust washer (9) is placed against washer (10).

(4) Install ball pivot bearing (11, Figure 4-19), washer (10), thrust washer (9), two wave washers (8), washer (7), three wave washers (6), and ball pivot cam (5) on ball pivot shaft (3).

NOTE
New groove pins should be used anytime they are removed.

(5) Using a hammer and punch, drive groove pin (4) into ball pivot shaft (3).

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

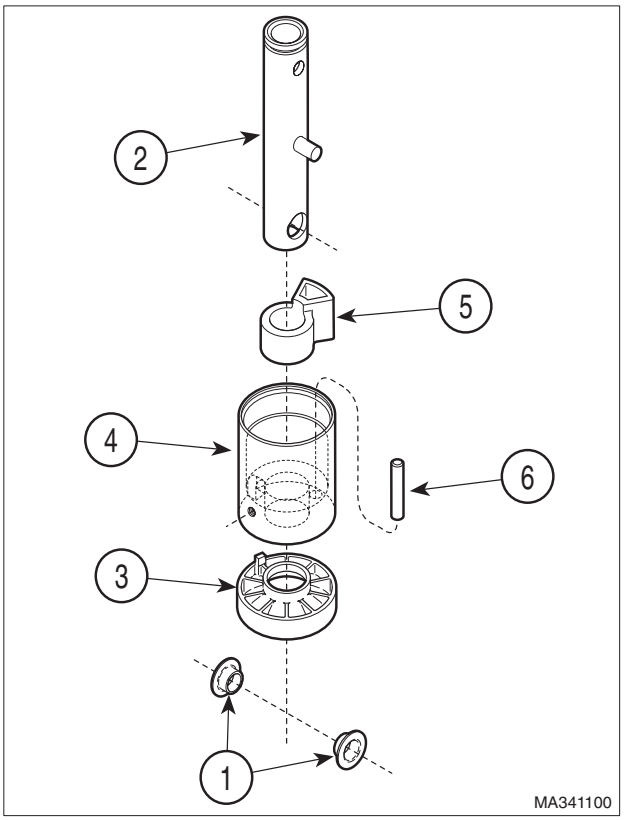


Figure 4-20. Ball Pivot Stop Removal / Installation

(6) Install washer (2) on ball pivot shaft (3) and secure with retaining ring (1).

D. Installation

EQUIPMENT ALERT
When feeding wires (3, Figure 4-16) thru ball pivot assembly (11), be sure to get one wire on each side of the pins that go thru the ball pivot shaft. Failure to do so could result in the wires being severed.

(1) Feed wires (3, Figure 4-18) through ball pivot assembly (11).

(2) Strip insulation from wires (3); then install one quick disconnect (9) on each wire (3).

(3) Position ball pivot assembly (11) on cross tube (5). Then, insert a punch through pin hole.

EQUIPMENT ALERT
Use 5/16" punch or similar device to divert the wires while the groove pin is being installed. Failure to do so will result in wires being sheared off.

NOTE
When installing groove pin (10), be sure to insert the non-grooved end of the pin into the ball pivot assembly (5) first. New groove pins should be used anytime they are removed.

(4) Using punch as a wire diverter to keep wires from being sheared off, install groove pin (10) to secure cross tube / lighthead (5) in ball pivot assembly (11).

WARNING
Make sure screws (6) are installed correctly. Failure to do so could allow the light assembly to fall, striking and injuring a patient or staff member.

NOTE
There are three screw holes in ball pivot assembly (11); two holes are larger and have coarser threads. Use these two holes to secure cross tube with screws (6). The other hole is for securing ball pivot sleeve with screw (1).

(5) Insert ball pivot assembly (11) into down tube (7) and secure with two screws (6), making sure wires (3) are fed up into down tube.

(6) Connect two wires (3) to two wires (4).

(7) Adjust ball pivot joint tension (Refer to para 4.14).

(8) Slide ball pivot sleeve (2) down into position and secure with screw (1).

(9) Connect electrical power to unit.

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

4.18 Lamp Tube Brake Adjustment

A. Adjustment

(1) Slide pivot sleeve (1, Figure 4-21) up out of way.

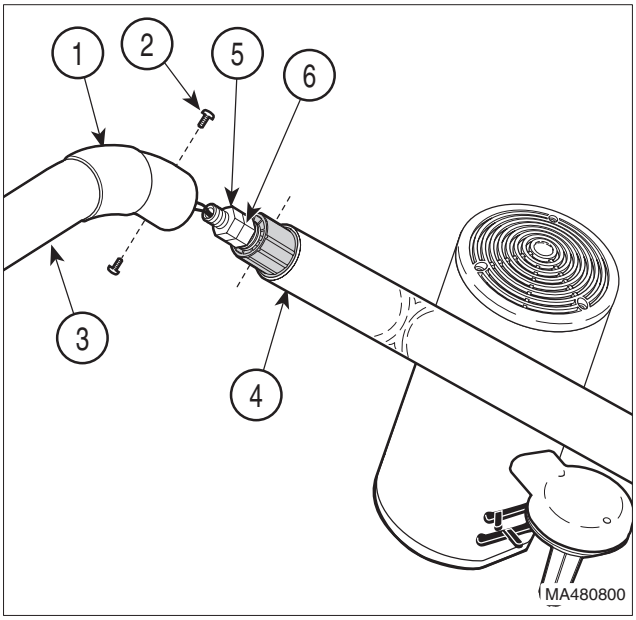


Figure 4-21. Lamp Tube Brake Adjustment

(2) Remove two screws (2) from cross tube (3); then separate lamp tube (4) from cross tube as far as wiring will allow.

(3) Loosen jam nut (5).

(4) Adjust nut (6) to tighten or loosen braking tension.

(5) While holding nut (6) stationary, tighten jam nut (5) to 20 to 30 ft.-lbs (27.1 to 40.7 N•m).

(6) Install lamp tube (4) in cross tube (3) and secure with two screws (2).

(7) Check brake adjustment. The lamp tube brake should hold when released and not allow the lamp tube to drift on its own, but also should not be too stiff as to prevent easy positioning by operator. If possible, consult the operator(s) on their desired brake tension setting.

(8) Repeat steps 2 through 7 until satisfactory brake adjustment is achieved.

(9) Slide pivot sleeve (1) down over pivot joint, making sure the indentations of the pivot sleeve seat on screws.

4.19 Lighthead Brake Adjustment

A. Adjustment

(1) Remove two screws (1, Figure 4-22) from lamp tube (2); then separate lamp tube (2) from lighthead (3) as far as wiring will allow.

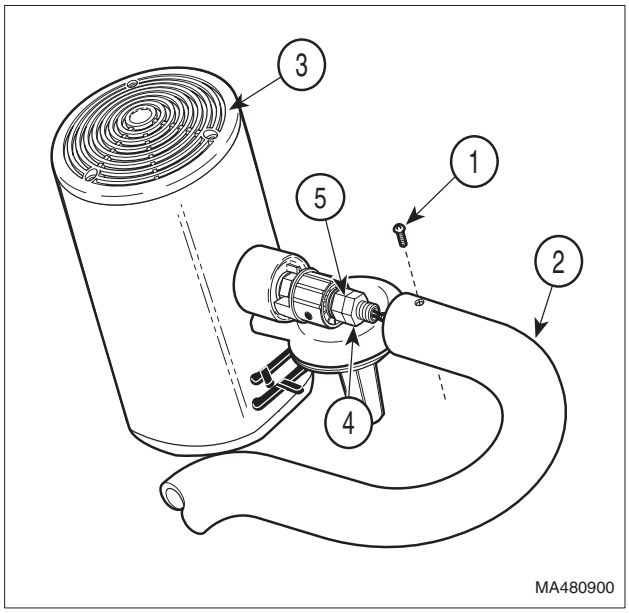


Figure 4-22. Lighthead Brake Adjustment

(2) Loosen jam nut (4).

(3) Adjust nut (5) to tighten or loosen braking tension.

(4) While holding nut (5) stationary, tighten jam nut (4) to 20 to 30 ft.-lbs (27.1 to 40.7 N•m).

WARNING
Make sure screws (1) are installed correctly. Failure to do so could allow the lighthead to fall, striking and injuring a patient or staff member.

(5) Install lighthead (3) in lamp tube (2) and secure with two screws (1).

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

(6) Check brake adjustment. The lighthead brake should hold when released and not allow the lighthead to drift on its own, but also should not be too stiff as to prevent easy positioning by operator. If possible, consult the operator(s) on their desired brake setting.

(7) Repeat steps 1 through 6 until satisfactory brake adjustment is achieved.

4.20 Lighthead Pivot Bearing Stop Removal / Installation

A. Removal

WARNING
Always disconnect electrical power to the unit before removing any of the unit's covers / shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Disconnect electrical power to unit.

(2) Remove two screws (1, Figure 4-23) and partially separate lighthead (2) from lamp tube (3).

(3) Disconnect two wires (4) from two wires (5) and remove lighthead (2).

(4) Remove nut (6), nut (7), three washers (8), wave washer (9), washer (10), wave washer (11), and pivot bearing stop (12) from shaft (13).

(5) If necessary, remove wave washer (14) from shaft (13).

B. Installation

(1) If removed, install wave washer (14) on shaft (13).

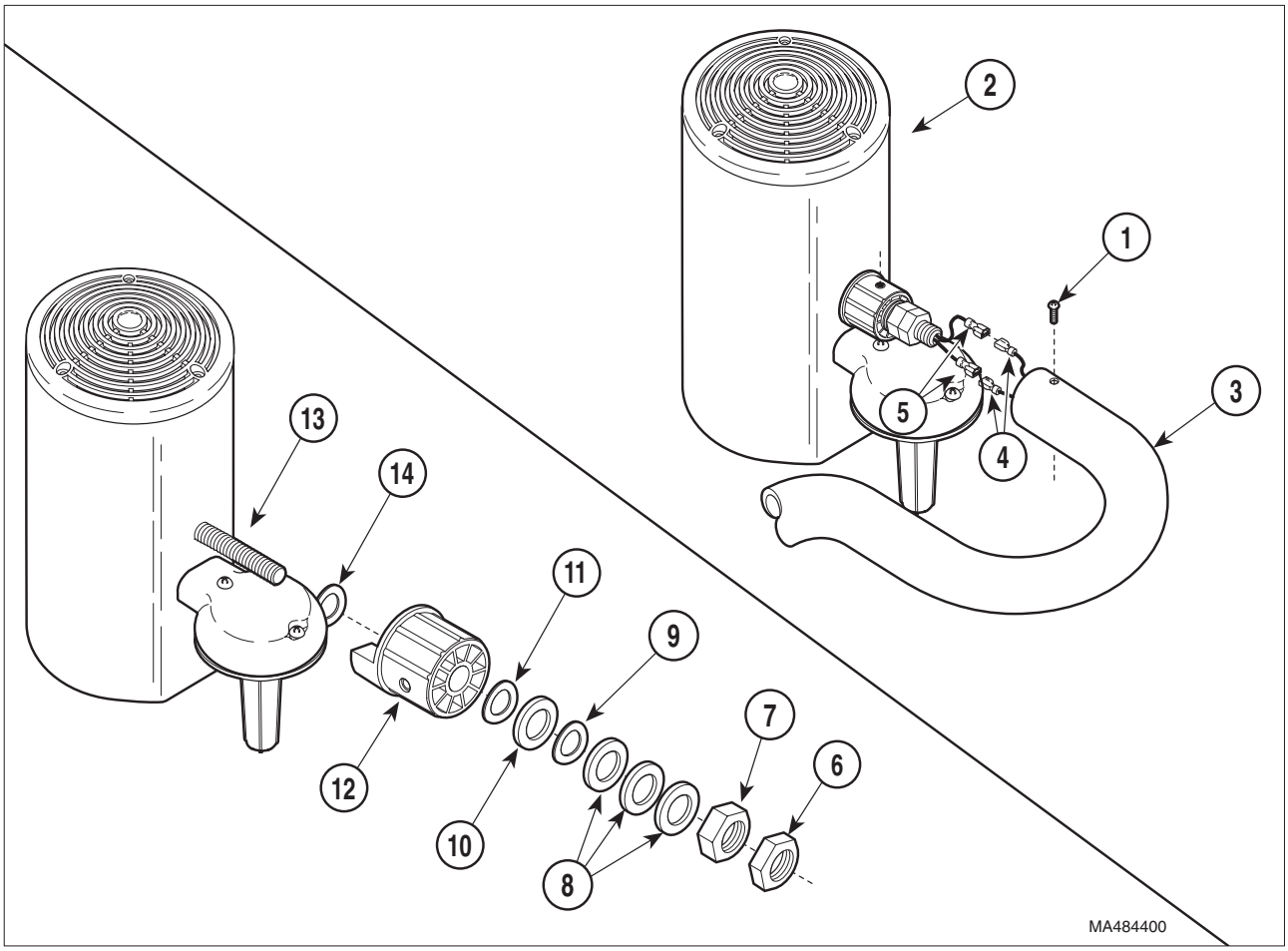


Figure 4-23. Lighthead Pivot Bearing Stop Removal / Installation

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

(2) Install pivot bearing stop (12), wave washer (11), washer (10), wave washer (9), three washers (8), nut (7), and nut (6) on shaft (13). Do not tighten nuts (6 and 7) at this time.

(3) Adjust nut (7) to tighten or loosen braking tension.

(4) While holding nut (7) stationary, tighten jam nut (6) to 20 to 30 ft.-lbs (27.1 to 40.7 N•m).

(5) Connect two wires (5) to two wires (4).

WARNING
Make sure screws (1) are installed correctly. Failure to do so could allow the lighthead assembly to fall, striking and injuring a patient or staff member.

(6) Insert lighthead (2) in lamp tube (3) and secure with two screws (1).

(7) Check brake adjustment. The lighthead brake should hold when released and not allow the lighthead to drift down on its own, but also should not be too stiff as to prevent easy positioning by the operator. If possible, consult the operator(s) on their desired brake setting.

(8) Repeat steps 3 thru 7 as necessary until desired braking action is attained.

(9) Connect electrical power to unit.

4.21 Main Pivot Stop Removal / Installation

A. Removal

WARNING
Always disconnect electrical power to the unit before removing any of the unit's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Disconnect electrical power to unit.

(2) Remove cross tube. (Perform steps 1 thru 4 of para 4.15, Removal).

(3) Remove four screws (1, Figure 4-24) and ceiling cover (2) from ceiling plate assembly (3).

(4) While pulling wires (4) up thru down tube (5), remove two screws (6) and down tube from main pivot housing (7).

NOTE
There are serrations on one end of groove pin. Drive groove pin (1, Figure 4-25) so that serrations do not go thru main shaft weldment (2).

(5) Using a hammer and punch, drive groove pin (1, Figure 4-25) out of main shaft weldment (2) and remove washer (3), main pivot housing (4) and main pivot stop (5) from main shaft weldment.

(6) If broken, remove groove pin (6 and / or 7).

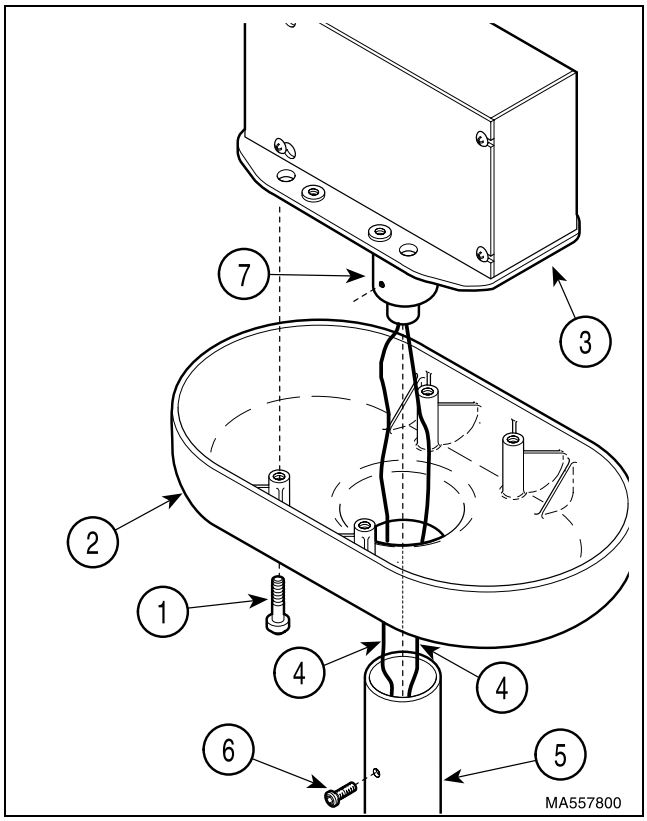


Figure 4-24. Ceiling Cover / Down Tube Removal / Installation

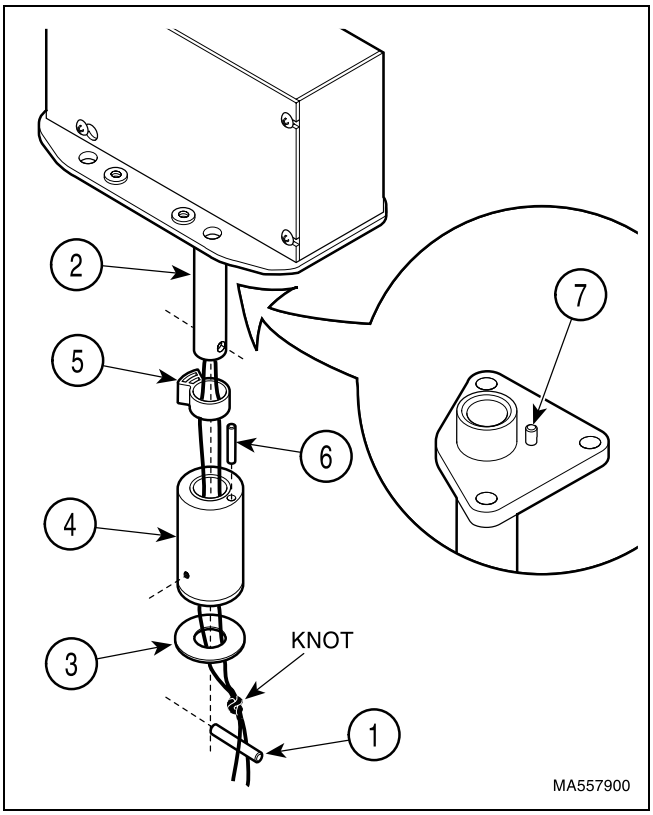


Figure 4-25. Main Pivot Stop Removal / Installation

B. Installation

NOTE
New groove pins should be used anytime they are removed.

(1) If removed, install groove pin (6 and / or 7, Figure 4-25).

EQUIPMENT ALERT
Make sure that strain relief knot (A) is above the groove pin (1) and that only one wire is on either side of the groove pin. Also, when installing groove pin, make sure it doesn't knick or tear the wires.

(2) Install main pivot stop (5), main pivot housing (4) and washer (3) on main shaft weldment (2) and secure by driving groove pin (1) in main shaft weldment.

(3) Coat threads of two screws (6, Figure 4-24) with removable threadlocking adhesive (Loctite 242).

WARNING
Make sure screws (6) are installed correctly. Failure to do so could allow the lighting system to fall, striking and injuring a patient or staff member.

NOTE
Attaching wires (4) to a longer, stiffer piece of wire will assist in feeding wires (4) thru down tube.

(4) While feeding two wires (4) up thru down tube (5), install down tube on main pivot housing (7) and secure with two screws (6). Tighten screws to 40 to 50 in-lbs (4.5 to 5.6 N m).

(5) Install ceiling cover (2) on ceiling plate assembly (3) and secure with four screws (1).

(6) Install cross tube. (Perform steps 5 thru 8 of para 4.15, Installation).

(7) Check for correct installation; if main pivot housing was installed correctly, the down tube can be rotated 580°.

(8) Connect electrical power to unit.

4.22 Lamp Tube Pivot Stop Removal / Installation

A. Removal

WARNING
Always disconnect electrical power to the unit before removing any of the unit's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Disconnect electrical power to unit.

(2) Remove two screws (1, Figure 4-26) and partially separate lighthead (2) from lamp tube (3).

(3) Disconnect two wires (4) from two wires (5) and remove lighthead (2).

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

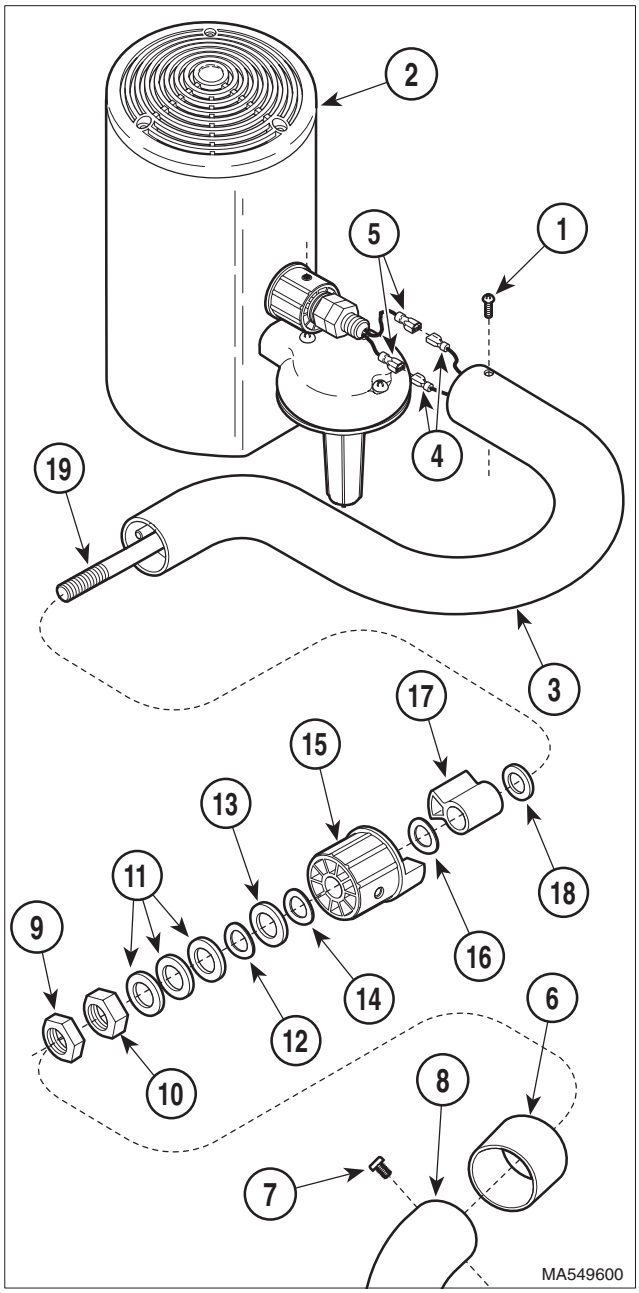


Figure 4-26. Lamp Tube Pivot Stop Removal / Installation

(4) Slide pivot sleeve (6) up out of way.

(5) Remove two screws (7) and separate lamp tube (3) from cross tube (8).

(6) Cut quick disconnect terminals from two wires (4).

(7) Pull two wires (4) out of lamp tube (3).

(8) Remove nut (9), nut (10), three washers (11), wave washer (12), washer (13), wave washer (14), pivot bearing (15), wave washer (16), lamp tube pivot stop (17), and flat washer (18) from shaft (19).

B. Installation

(1) Install flat washer (18), lamp tube pivot stop (17), wave washer (16), pivot bearing (15), wave washer (14), washer (13), wave washer (12), three washers (11), nut (10), and nut (9) on shaft (19). Do not tighten nuts at this time.

(2) Feed two wires (4) thru lamp tube (3). Strip insulation from wires and then install two quick disconnects on two wires (4).

(3) Connect two wires (4) to two wires (5).

(4) Insert lighthead (2) into lamp tube (3) and secure with two screws (1).

(5) Adjust nut (10) to tighten or loosen braking tension.

(6) While holding nut (10) stationary, tighten jam nut (9) to 20 to 30 ft.-lbs (27.1 to 40.7 N•m).

WARNING
Make sure screws (2) are installed correctly. Failure to do so could allow the faceplate assembly to fall, striking and injuring a patient or staff member.

(7) Insert lamp tube (3) into cross tube (8) and secure with two screws (7).

(8) Check brake adjustment. The lamp tube brake should hold when released and not allow the lamp tube to drift on its own, but also should not be too stiff as to prevent easy positioning by operator. If possible, consult the operator(s) on their desired brake setting.

(9) Repeat steps 5 thru 8 as necessary until desired braking action is attained.

(10) Slide pivot sleeve (6) down over pivot joint, making sure the indentations of the pivot sleeve seats on screws

(11) Connect electrical power to unit.

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

© Midmark Corporation 2000 SF-1771

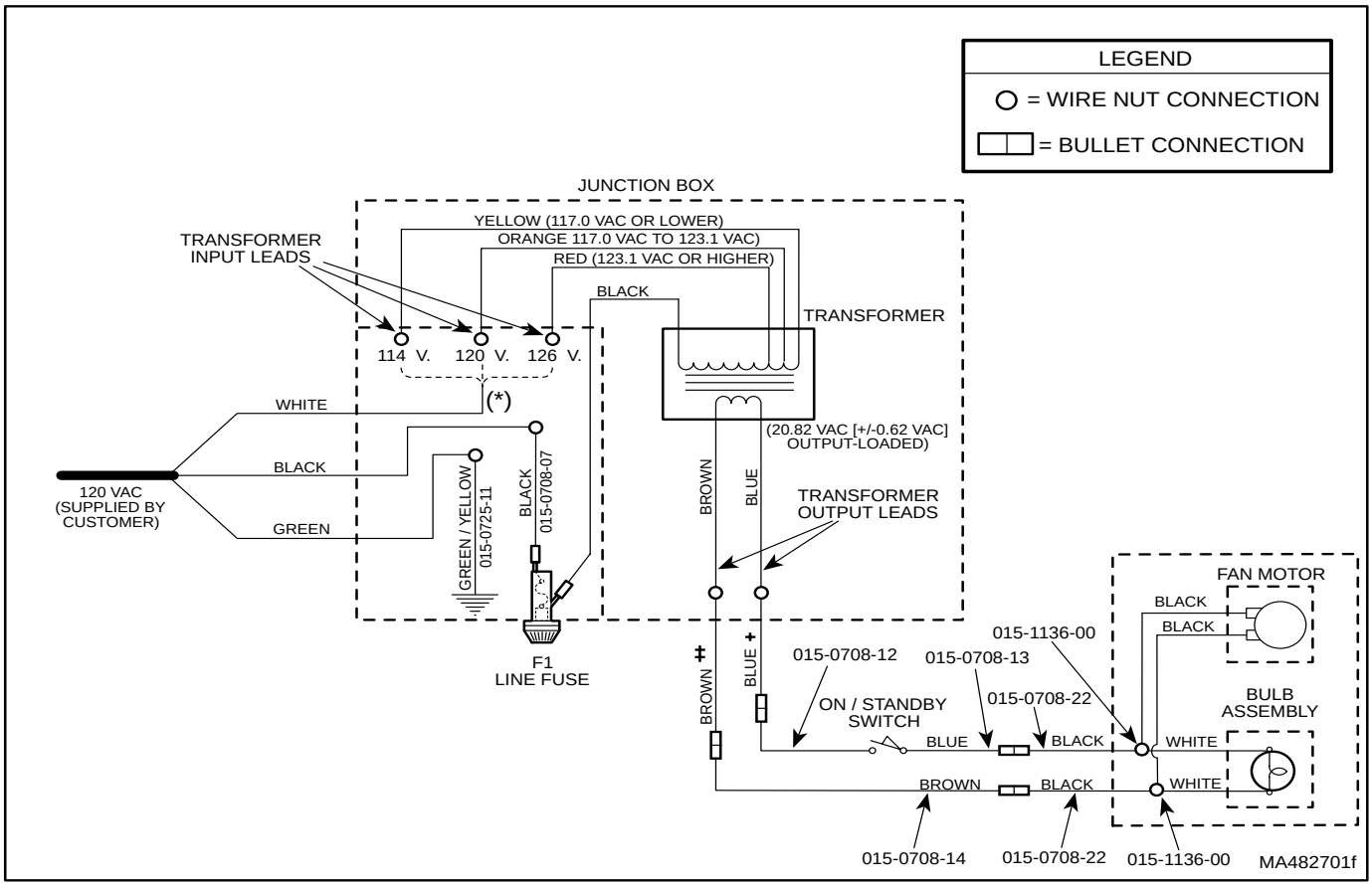
Printed in U.S.A.

SECTION V
SCHEMATICS AND DIAGRAMS

5.1 Electrical Schematics / Wiring Diagrams

Figure 5-1 illustrates the logic / current flow and wiring connections between the electrical components in the 354 models listed. Since each junction box is wired separately, the electrical schematic / wiring diagram for a dual lighting system is the same.

For electrical schematic / wiring diagram for the 355 portion of the 354 (-016 thru -019) combination units, refer to the 355 Service and Parts Manual. (Midmark part number: 004-0105-00)



NOTE
Measure facility line voltage; then connect the power lead (white wire) to the appropriate input tap.

117.0 VAC or lower - Use YELLOW input tap
117.1 to 123.0 VAC - Use ORANGE input tap
123.1 VAC or higher - Use RED input tap

+ 354 (-001, -002, -007, -008, -016, -018) use 015-0708-15
354 (-003, -004, -009, -010, -017, -019) use 015-0708-17

‡ 354 (-001, -002, -007, -008, -016, -018) use 015-0708-16
354 (-003, -004, -009, -010, -017, -019) use 015-0708-18

Figure 5-1. Electrical Schematic / Wiring Diagram 354(-001 thru -004, -007 thru -010 & -016 thru -019)

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

SECTION V
SCHEMATICS AND DIAGRAMS

Figure 5-2 illustrates the logic / current flow and wiring connections between the electrical components in the 354 Single Ceiling Light models listed.

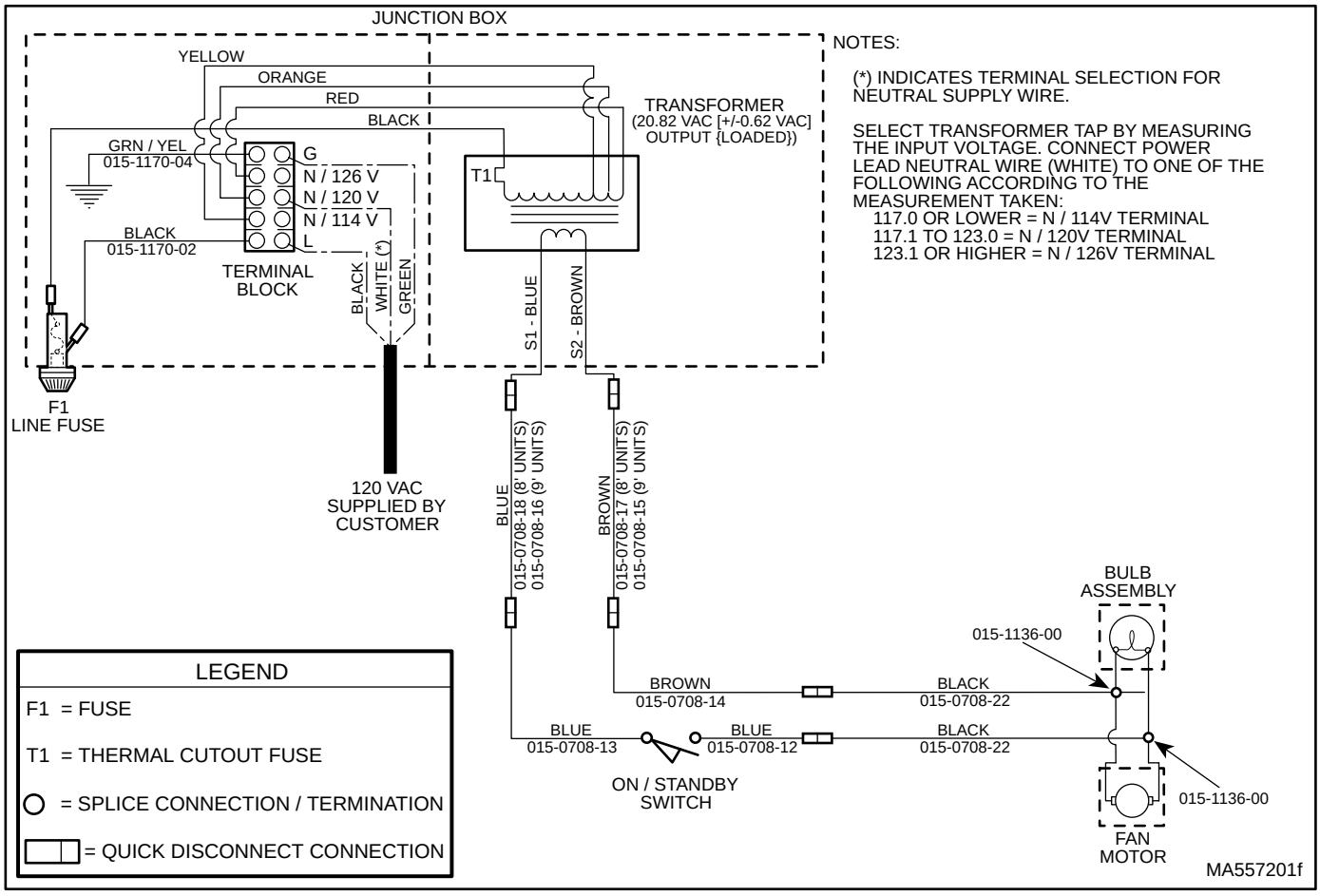


Figure 5-2. Electrical Schematic / Wiring Diagram 354(-025, -026, -028, & -029)

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

Figure 5-3 illustrates the logic / current flow and wiring connections between the electrical components in the 354 Double Ceiling Light models listed.

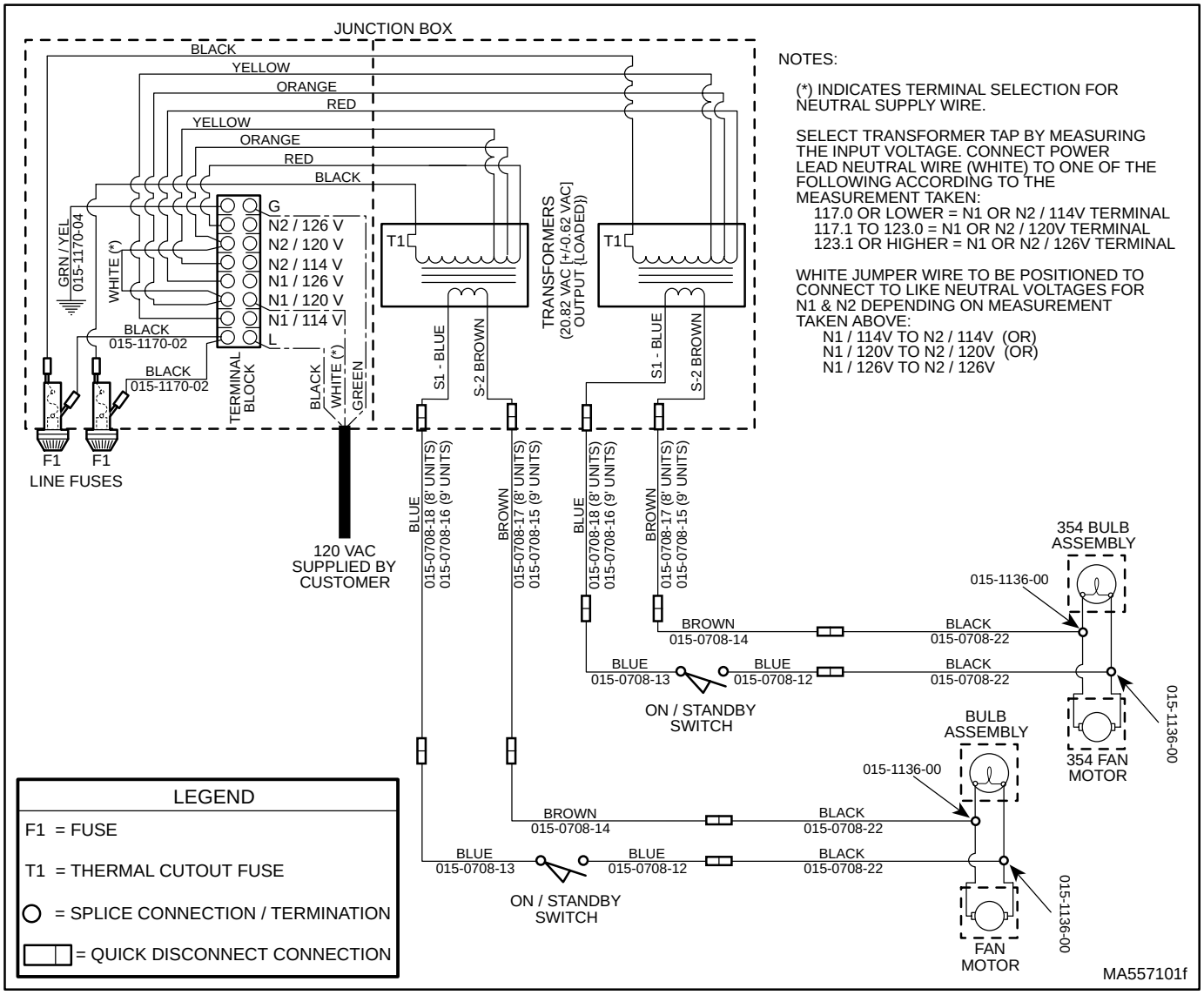


Figure 5-3. Electrical Schematic / Wiring Diagram
354(-031, -032, -034, & -035)

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

SECTION V
SCHEMATICS AND DIAGRAMS

Figure 5-4 illustrates the logic / current flow and wiring connections between the electrical components in the 354 / 355 Combination Light models listed.

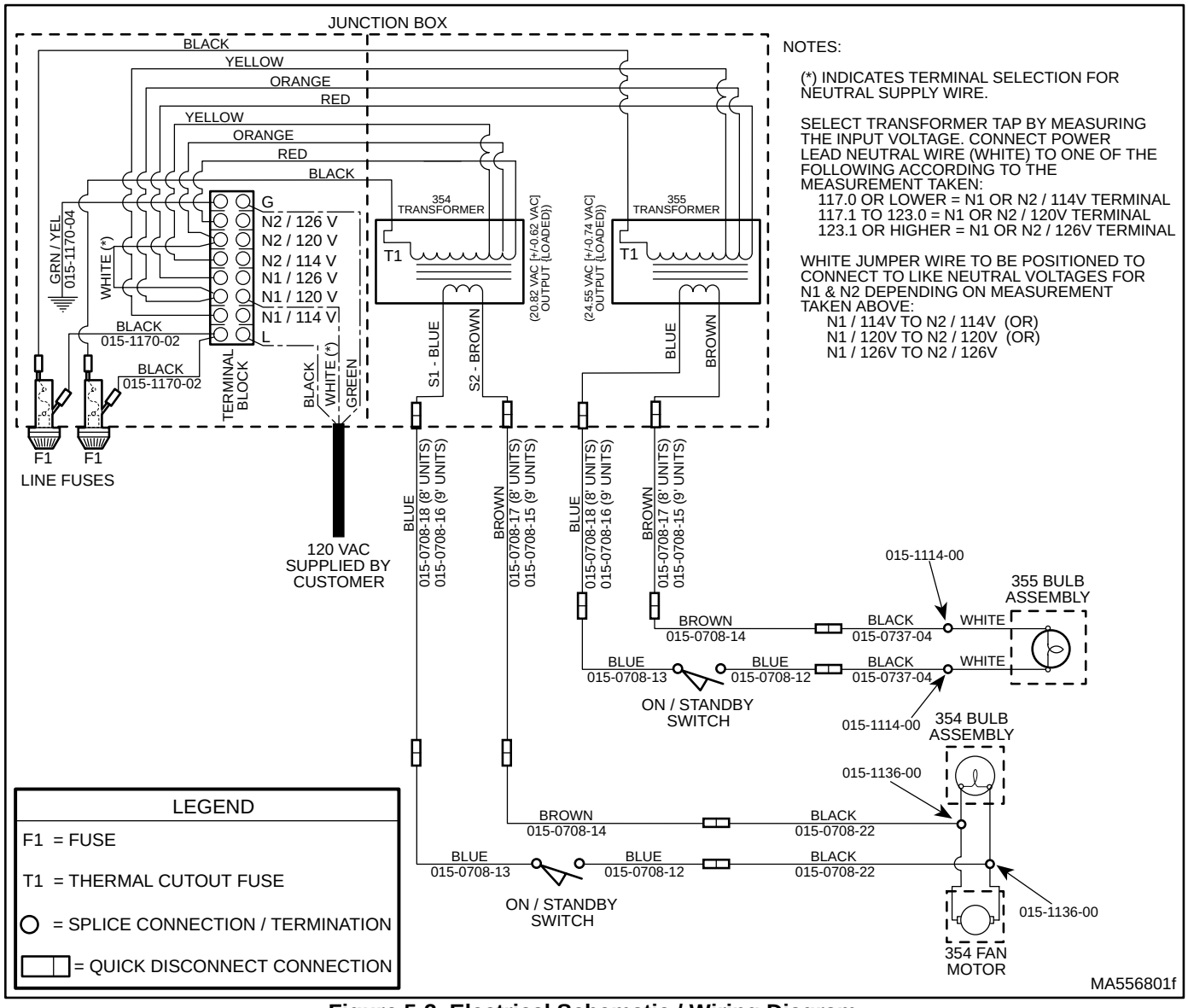


Figure 5-3. Electrical Schematic / Wiring Diagram
354(-037, -038, -040, & -041) Double Combination (354 / 355) Lights

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

SECTION VI
PARTS LIST

6.1 Introduction

The illustrated parts list provides information for identifying and ordering the parts necessary to maintain the unit in peak operating condition. Refer to paragraph 1.5 for parts ordering information.

6.2 Description of Columns

The Item column of the parts list gives a component its own unique number. The same number is given to the component in the parts illustration. This allows a part number of a component to be found if the technician can visually spot the part on the illustration. The technician simply finds the component in question on the illustration and notes the item number of that component. Then, he finds that item number in the parts list. The row corresponding to the item number gives the technician the part number, a description of the component, and quantity of parts per subassembly. Also, if a part number is known, the location of that component can be determined by looking for the item number of the component on the illustration.

The Part No. column lists the MIDMARK part number for that component.

The Description column provides a physical description of the component.

The Qty. column lists the number of units of a particular component that is required for the subassembly. The letters “AR” denote “as required” when quantities of a particular component cannot be determined, such as: adhesive.

Bullets { • } in the Part No. column and the Description column show the indenture level of a component. If a component does not have a bullet, it is a main component of that illustration. If a component has a bullet, it is a subcomponent of the next component listed higher in the parts list than itself that does not have a bullet. Likewise, if a component has two bullets, it is a subcomponent of the next component listed higher in the parts list than itself that has only one bullet.

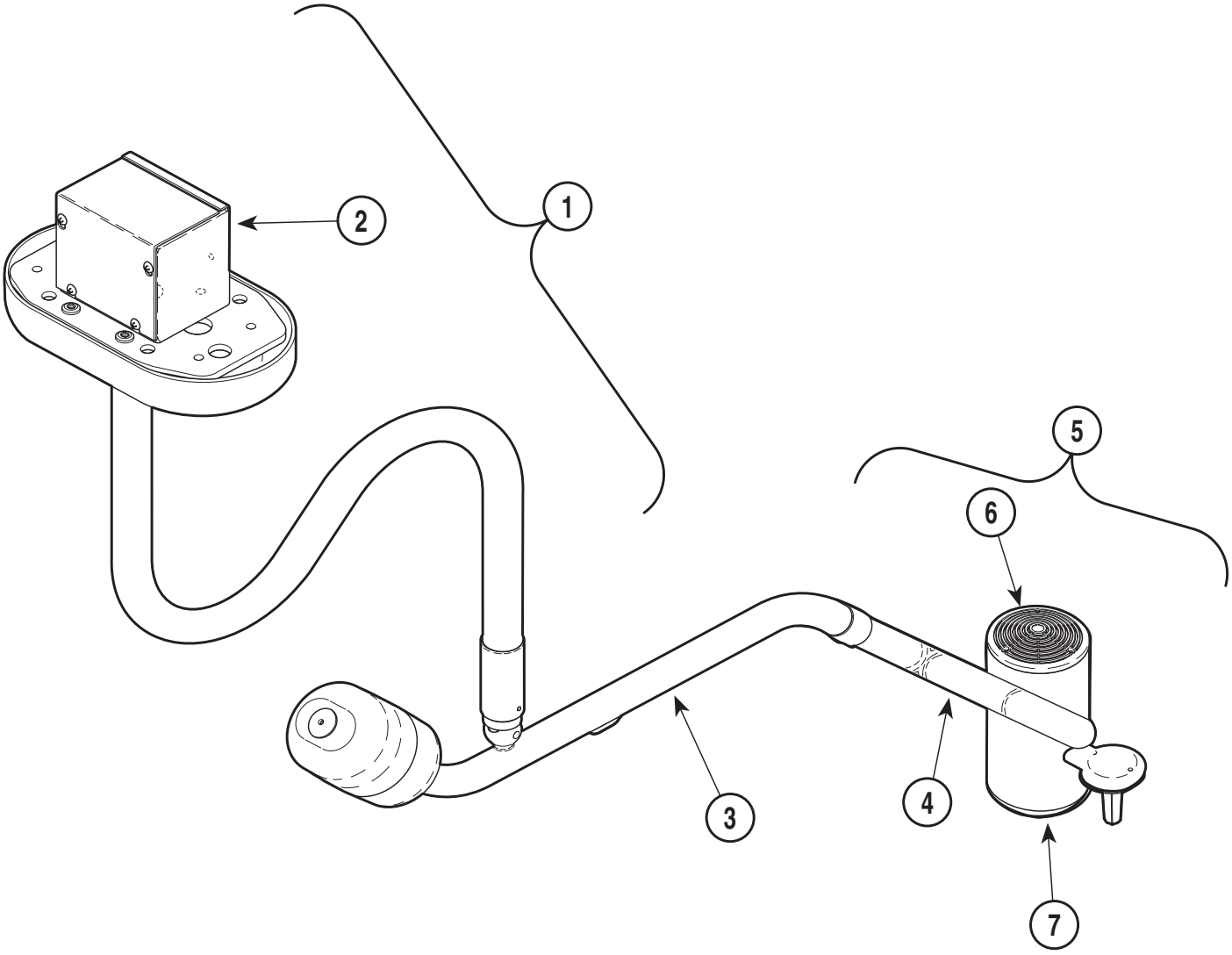
6.3 Torque Specifications and Important Assembly Notes

When specific assembly torque specifications, measurements, or procedures have been identified, by our engineering department, as required to assure proper function of the unit, those torque specifications measurements, and procedures will be noted on the parts illustrations. Adherence to these requirements is essential.

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

Ritter 354 Single Light System



MA481600

Item	Model No.	Description	Page
	354-001	120 V. Ritter 354 Single Light System - 9'	
	354-028	(Includes Items 1 thru 5)	6-2
	354-003	120 V. Ritter 354 Single Light System - 8'	
	354-025	(Includes Items 1 thru 5)	6-2

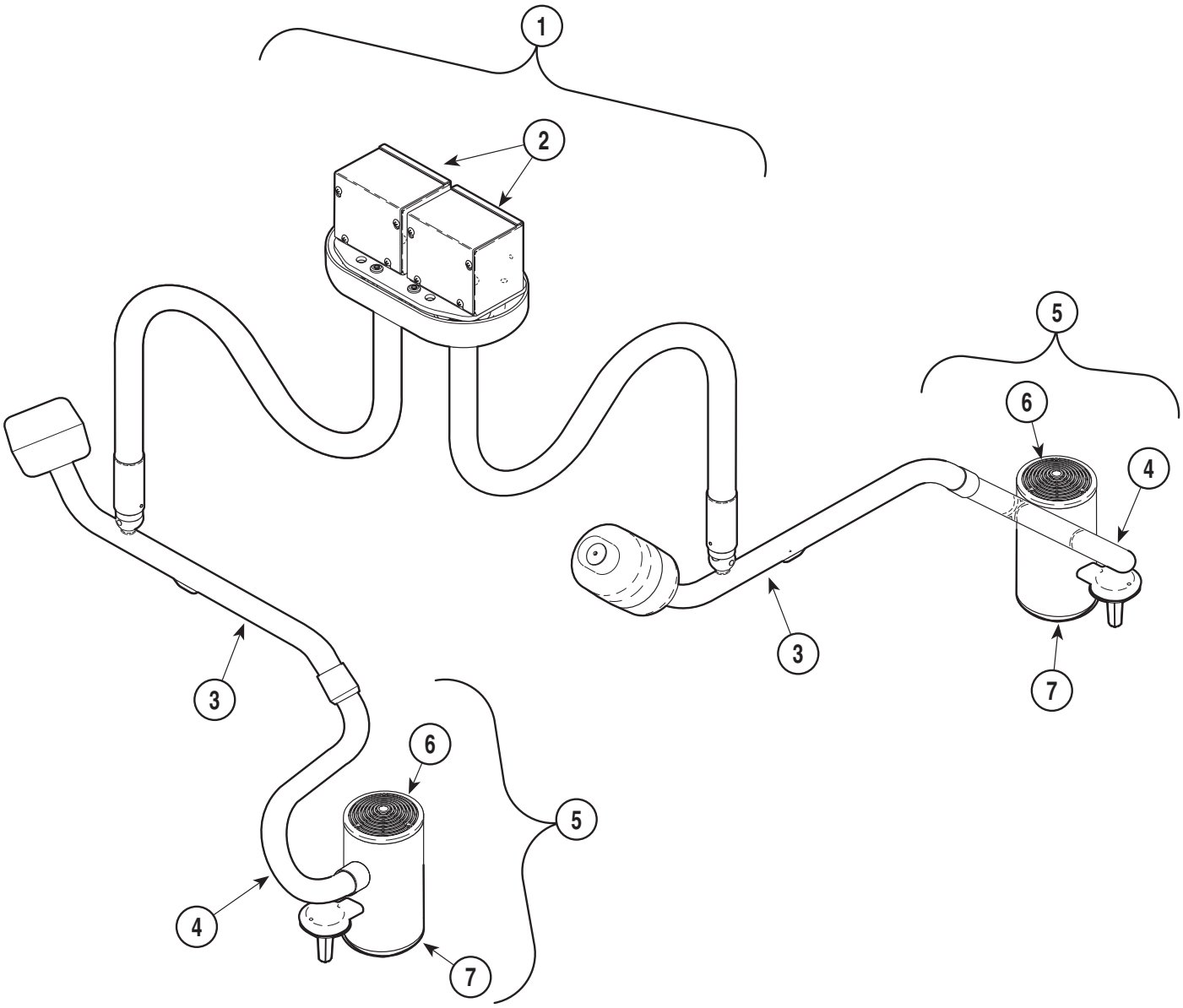
Item	Part No.	Description	Page
1	•	• Down Tube Assembly	6-8
2	•	• Single Ceiling Plate Assembly	6-9
3	•	• Cross Tube Assembly	6-12
4	•	• Lamp Tube Assembly	6-13
5	•	• 354 Lighthead Assembly (Includes Items 5 thru 7)	6-14
6	• •	• • Bulb Carriage Assembly	6-15
7	• •	• • Optic Assembly	6-16

Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

Ritter 354 Double Light System



MA481700

Item	Model No.	Description	Page
	354-002	120 V. Ritter 354 Double Light System - 9'	
	354-034	(Includes Items 1 thru 5)	6-3
	354-004	120 V. Ritter 354 Double Light System - 8'	
	354-031	(Includes Items 1 thru 5)	6-3

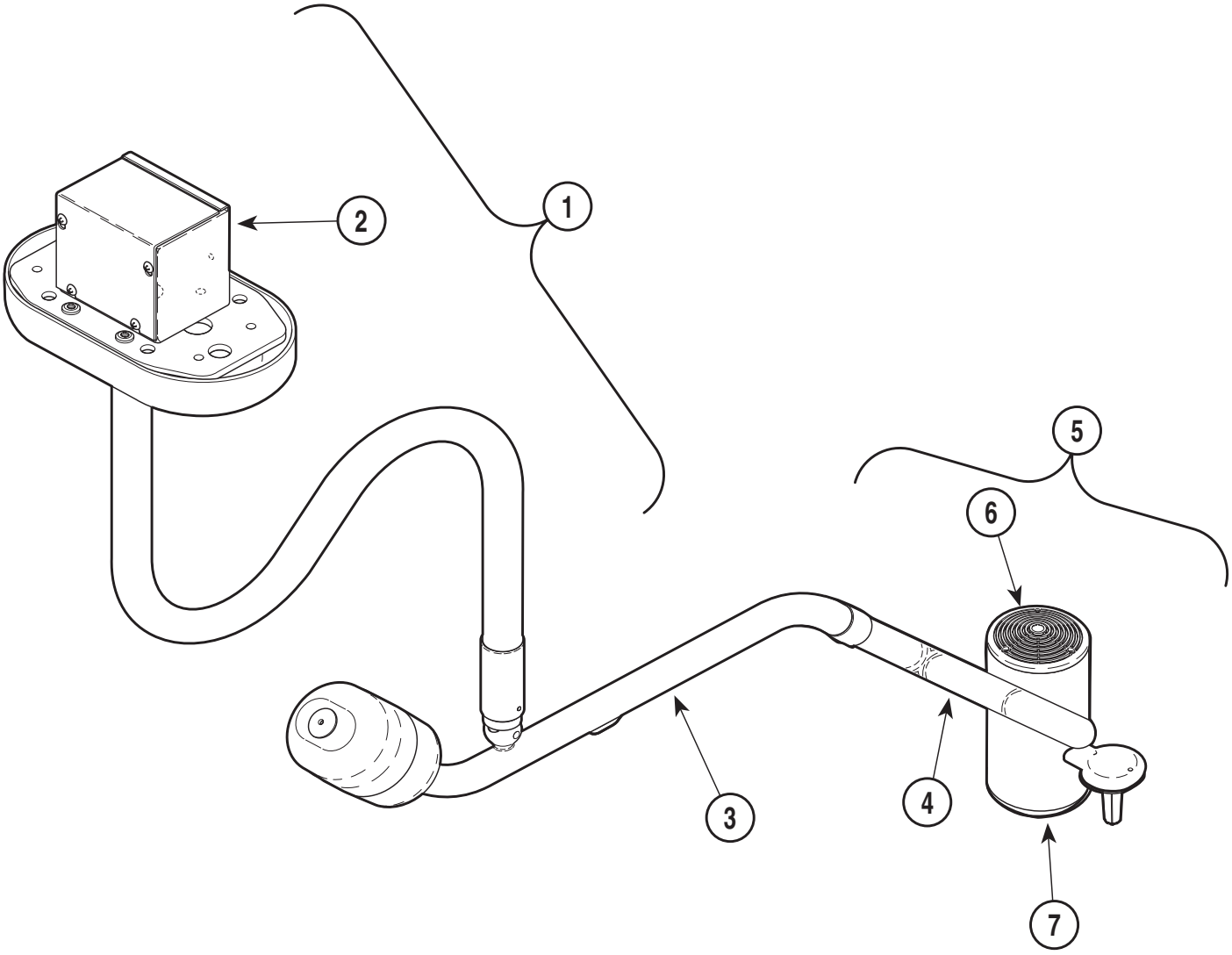
Item	Part No.	Description	Page
1	•	• Down Tube Assembly	6-8
2	•	• Double Ceiling Plate Assembly	6-10
3	•	• Cross Tube Assembly	6-12
4	•	• Lamp Tube Assembly	6-13
5	•	• 354 Lighthead Assembly (Includes Items 5 and 6)	6-11
6	• •	• • Bulb Carriage Assembly	6-15
7	• •	• • Optic Assembly	6-16

Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

Midmark 354 Single Light System



MA48160

Item	Model No.	Description	Page
	354-007	120 V. Midmark 354 Single Light System	
	354-029	9' (Includes Items 1 thru 5)	6-4
	354-009	120 V. Midmark 354 Single Light System	
	354-026	8' (Includes Items 1 thru 5)	6-4

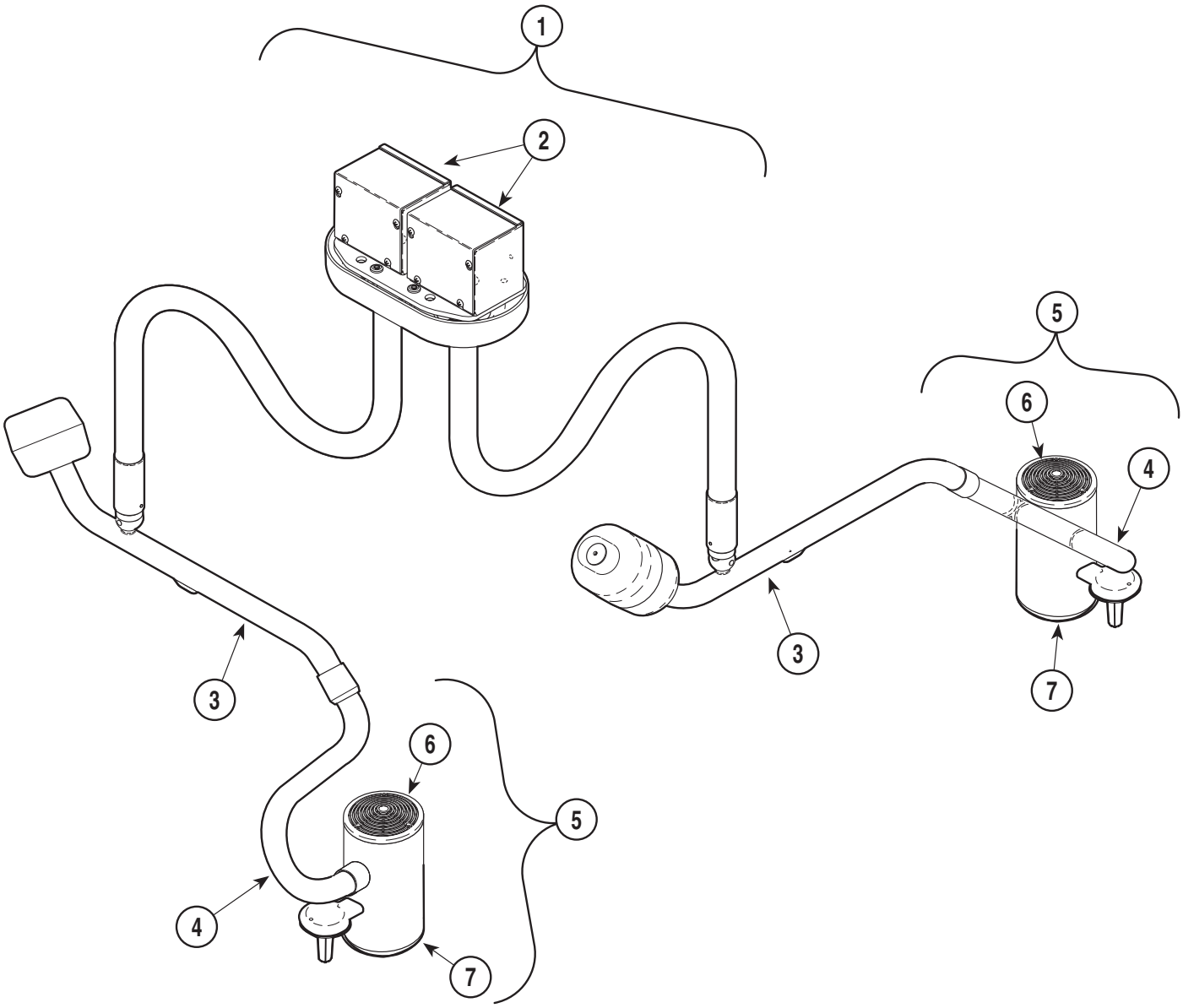
Item	Part No.	Description	Page
1	•	• Down Tube Assembly	6-8
2	•	• Single Ceiling Plate Assembly	6-9
3	•	• Cross Tube Assembly	6-12
4	•	• Lamp Tube Assembly	6-13
5	•	• 354 Lighthead Assembly (Includes Items 5 thru 7)	6-14
6	• •	• • Bulb Carriage Assembly	6-15
7	• •	• • Optic Assembly	6-16

Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

Midmark 354 Double Light System



MA481700

Item	Model No.	Description	Page
	354-008	120 V. Midmark 354 Double Light System	
	354-035	9' (Includes Items 1 thru 5)	6-5
	354-010	120 V. Midmark 354 Double Light System	
	354-032	8' (Includes Items 1 thru 5)	6-5

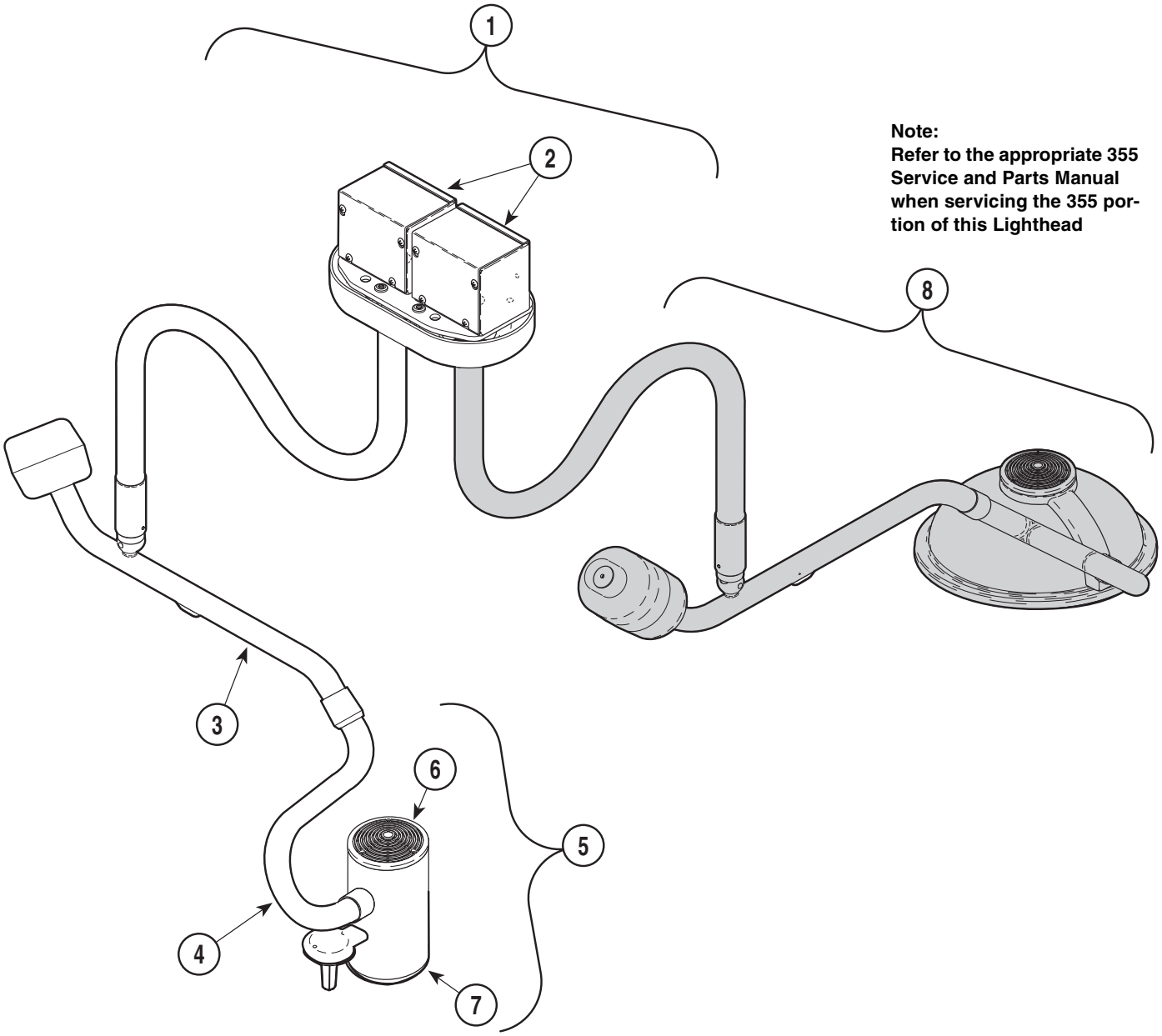
Item	Part No.	Description	Page
1	•	• Down Tube Assembly	6-8
2	•	• Double Ceiling Plate Assembly	6-10
3	•	• Cross Tube Assembly	6-12
4	•	• Lamp Tube Assembly	6-13
5	•	• 354 Lighthead Assembly (Includes Items 5 and 6)	6-14
6	• •	• • Bulb Carriage Assembly	6-15
7	• •	• • Optic Assembly	6-16

Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

Ritter 354 Combination Light System



Note:
Refer to the appropriate 355 Service and Parts Manual when servicing the 355 portion of this Lighthead

MA481800

Item	Model No.	Description	Page
	354-016	120 V. Ritter 354 / 355 Combo. Light Sys.	
	354-040	9' (Includes Items 1 thru 5)	6-6
	354-017	120 V. Ritter 354 / 355 Combo. Light Sys.	
	354-037	8' (Includes Items 1 thru 5)	6-6

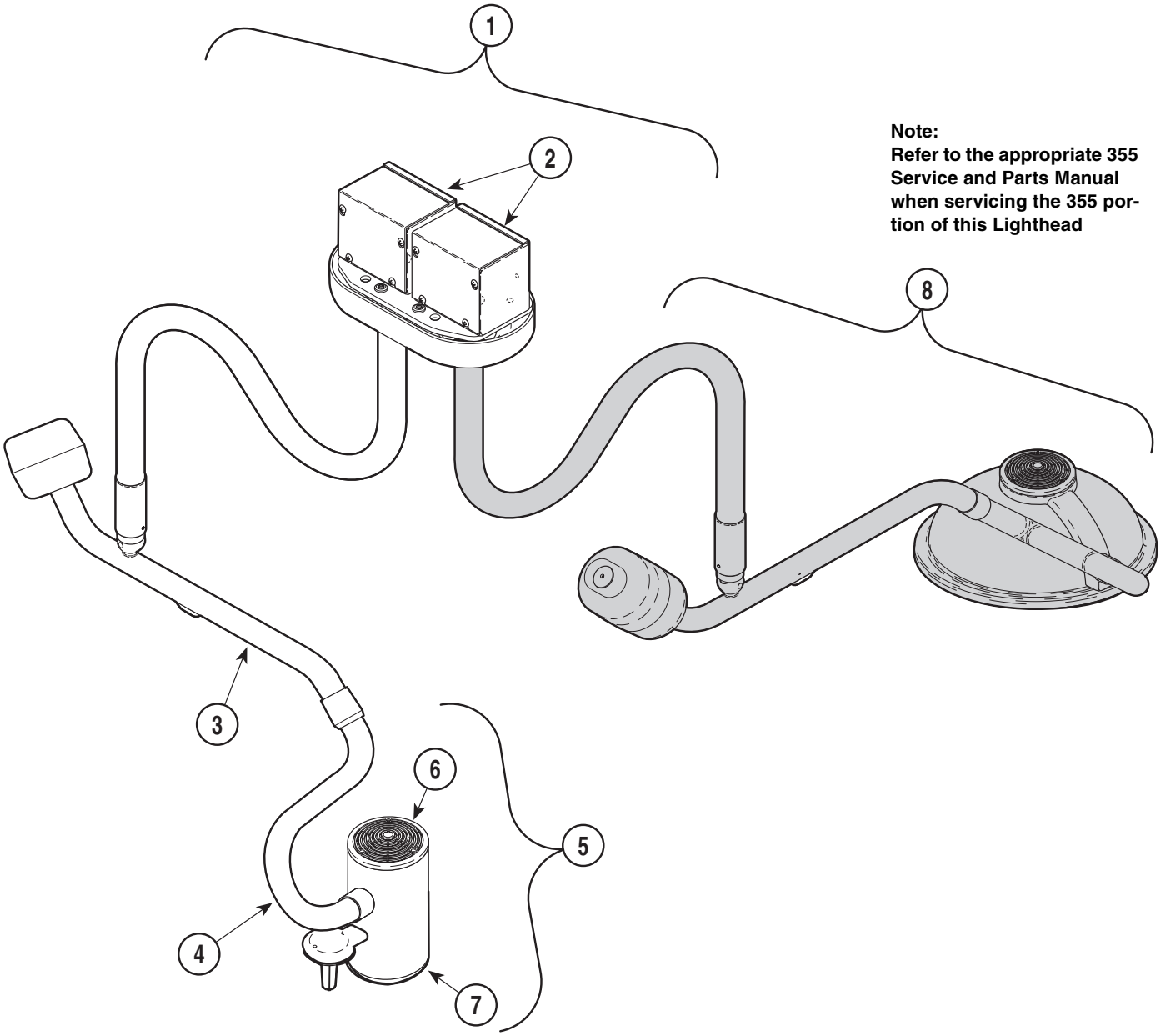
Item	Part No.	Description	Page
1	•	• Down Tube Assembly	6-8
2	•	• Combination Ceiling Plate Assy.	6-11
3	•	• Cross Tube Assembly	6-12
4	•	• Lamp Tube Assembly	6-13
5	•	• 354 Lighthead Assembly (Includes Items 6 and 7)	6-14
6	• •	• • Bulb Carriage Assembly	6-15
7	• •	• • Optic Assembly	6-16
8	•	• 355 Lighthead Assembly (Refer to 355 Service and Parts Manual [Part Number 004-0105-00]	Ref.

Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

Midmark 354 Combination Light System



Note:
Refer to the appropriate 355 Service and Parts Manual when servicing the 355 portion of this Lighthead

MA481800

Item	Model No.	Description	Page
	354-018	120 V. Midmark 354 / 355 Combo. Light	
	354-041	System 9' (Includes Items 1 thru 5)	6-7
	354-019	120 V. Midmark 354 / 355 Combo. Light	
	354-038	System 8' (Includes Items 1 thru 5)	6-7

Item	Part No.	Description	Page
1	•	• Down Tube Assembly	6-8
2	•	• Combination Ceiling Plate Assy.	6-11
3	•	• Cross Tube Assembly	6-12
4	•	• Lamp Tube Assembly	6-13
5	•	• 354 Lighthead Assembly (Includes Items 6 and 7)	6-14
6	• •	• • Bulb Carriage Assembly	6-15
7	• •	• • Optic Assembly	6-16
8	•	• 355 Lighthead Assembly (Refer to 355 Service and Parts Manual [Part Number 004-0105-00])	Ref.

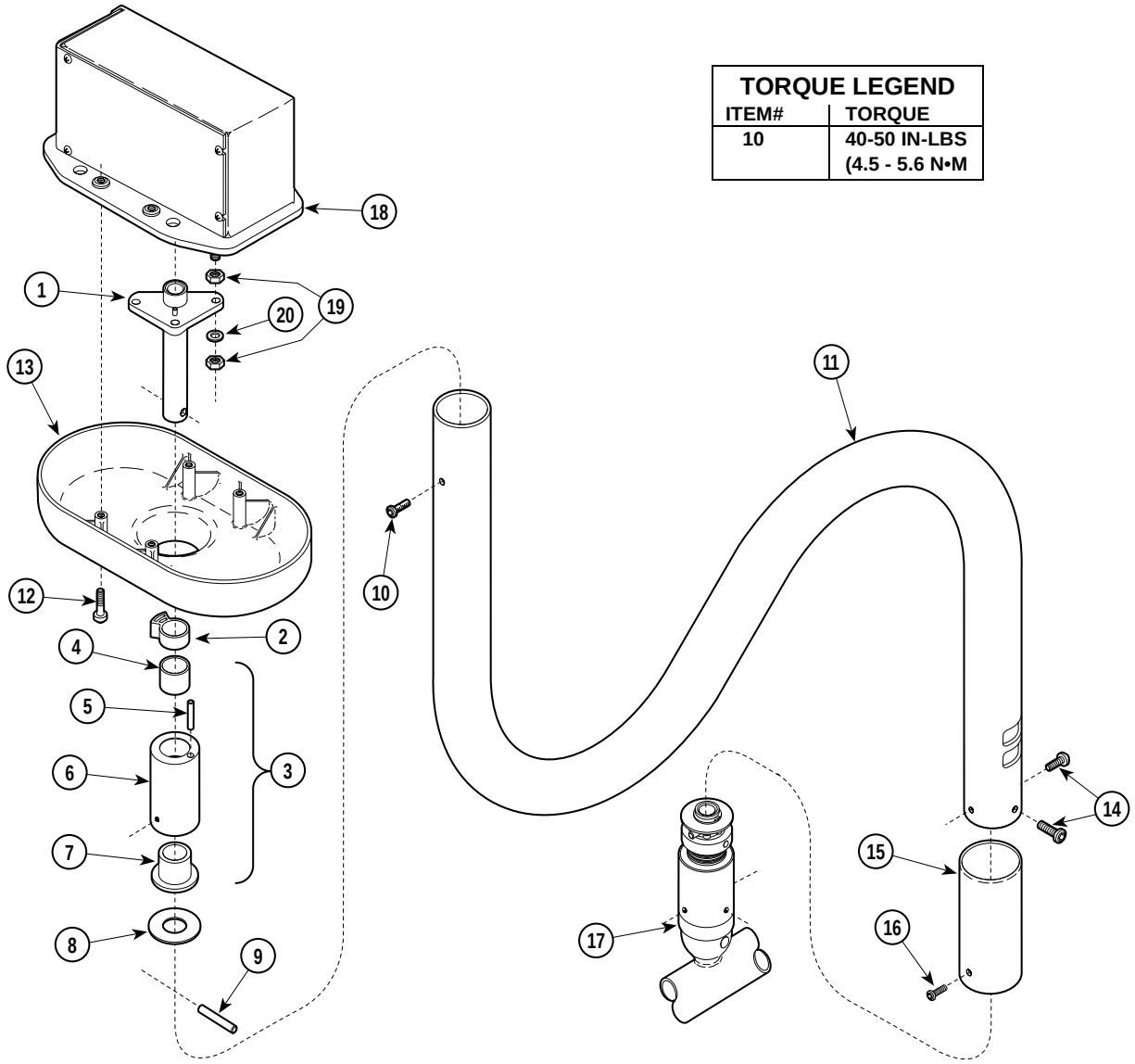
Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

Down Tube Assembly

TORQUE LEGEND	
ITEM#	TORQUE
10	40-50 IN-LBS (4.5 - 5.6 N•M



MA553200

Used on units with Serial Number KN1000, KP1000, KS1000, KT1000, LY1000, LZ1000, MA1000, MB1000, MD1000, ME1000 thru Present & MX1000 thru MX 1112, MZ1000 thru MZ1167

Item	Part No.	Description	Qty.
	002-0572-00	8'Down Tube Assembly Kit (Includes Items 1 thru 11)	1
	002-0571-00	9'Down Tube Assembly Kit (Includes Items 1 thru 11)	1
1	•030-1007-00	•Main Shaft Weldment	1
2	•002-0561-00	•Main Pivot Stop Kit (Includes Item 9)	1
3	•029-1935-00	•Main Bearing Assembly (Includes Items 4 thru 7)	1
4	••016-0540-02	••DX Bearing	1
5	••042-0157-01	••Groove Pin	1
6	••057-0412-00	••Main Pivot Housing	1
7	••016-0131-15	••Flanged Bearing	1
8	•045-0001-113	•Washer	1
9	•042-0157-01	•Groove Pin	1
10	•040-0010-131	•Screw (Apply Loctite #042-0024-00)	2
11	•052-0314-00	•8'Down Tube	1
	•052-0264-00	•9'Down Tube	1
12	040-0010-132	Screw	4
13	053-0733-00	Single Ceiling Cover (Shown)	1
	053-0758-00	Double Ceiling Cover (Not Shown)	1
14	040-0010-131	Screw	2
15	053-0807-00	Ball Pivot Sleeve	1
16	040-0008-91	Screw	1
17		Cross Tube Assembly (Refer to "Cross Tube Assembly" Elsewhere)	Ref.
18		Ceiling Plate (Refer to "Single or Double Ceiling Plate Assembly" Elsewhere)	Ref.
19	041-0375-01	Nut (Single Units)	6
	041-0375-01	Nut (Double Units)	12
20	045-0001-09	Lockwasher (Single Units)	3
	045-0001-09	Lockwasher (Double Units)	6
21	002-0592-00	Dimmer Control Kit (Not Shown)	1

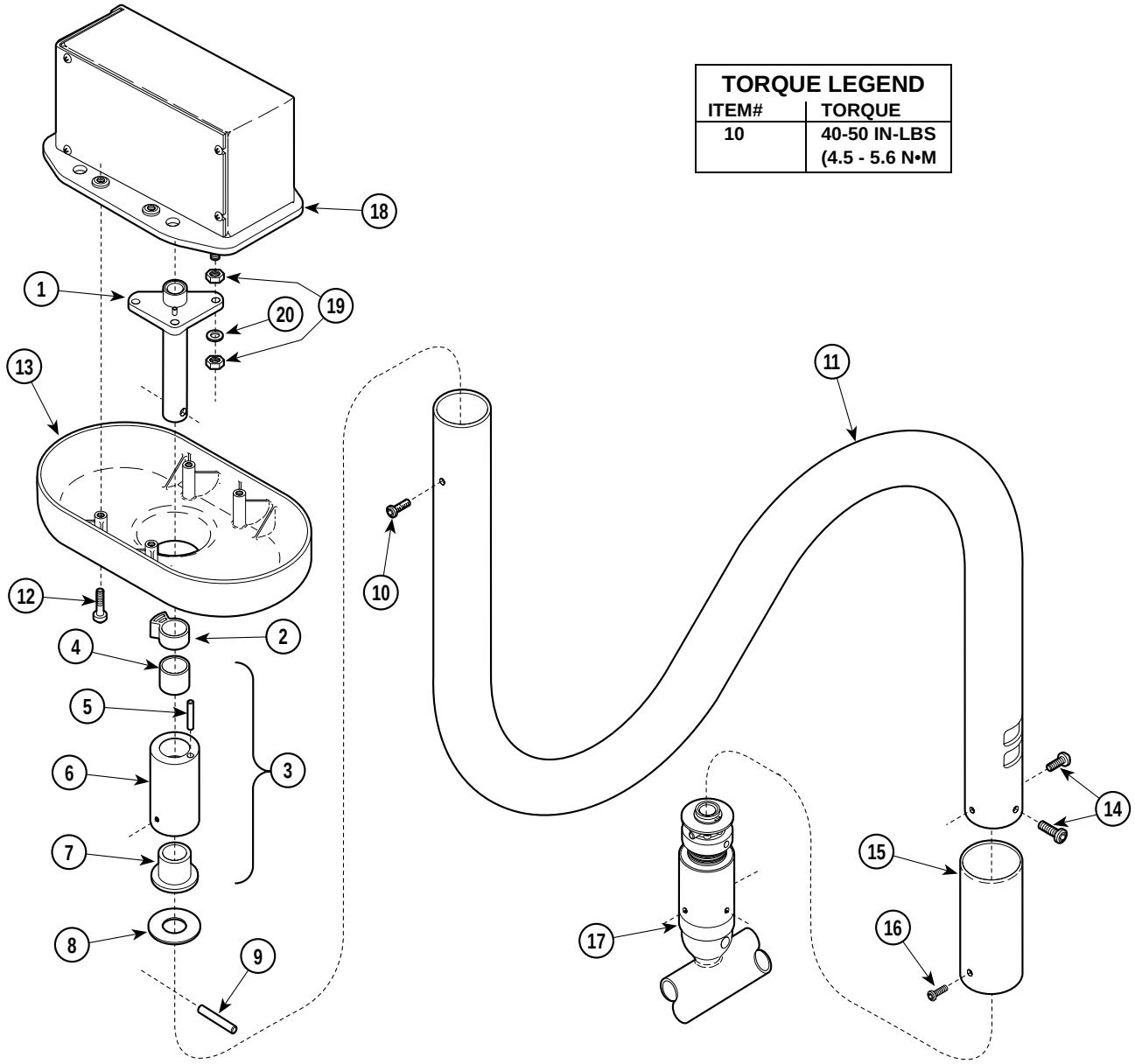
Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771 Rev. 1/03

Printed in U.S.A.

Down Tube Assembly

TORQUE LEGEND	
ITEM#	TORQUE
10	40-50 IN-LBS (4.5 - 5.6 N•M



MA553200

Used on units with Serial Number MX1113 & MZ1168 thru Present

Item	Part No.	Description	Qty.
	002-0572-00	8'Down Tube Assembly Kit (Includes Items 1 thru 11)	1
	002-0571-00	9'Down Tube Assembly Kit (Includes Items 1 thru 11)	1
1	•030-1007-00	•Main Shaft Weldment	1
2	•002-0561-00	•Main Pivot Stop Kit (Includes Item 9)	1
3	•029-1935-00	•Main Bearing Assembly (Includes Items 4 thru 7)	1
4	••016-0540-02	••DX Bearing	1
5	••042-0157-01	••Groove Pin	1
6	••057-0412-00	••Main Pivot Housing	1
7	••016-0131-15	••Flanged Bearing	1
8	•045-0001-113	•Washer	1
9	•042-0157-01	•Groove Pin	1
10	•040-0010-131	•Screw (Apply Loctite #042-0024-00)	2
11	•052-0314-00	•8'Down Tube	1
	•052-0264-00	•9'Down Tube	1
12	040-0010-132	Screw	4
13	053-0733-00	Single Ceiling Cover (Shown)	1
	053-0758-00	Double Ceiling Cover (Not Shown)	1
14	040-0010-131	Screw	2
15	053-0807-00	Ball Pivot Sleeve	1
16	040-0010-124	Screw	1
17		Cross Tube Assembly (Refer to "Cross Tube Assembly" Elsewhere)	Ref.
18		Ceiling Plate (Refer to "Single or Double Ceiling Plate Assembly" Elsewhere)	Ref.
19	041-0375-01	Nut (Single Units)	6
	041-0375-01	Nut (Double Units)	12
20	045-0001-09	Lockwasher (Single Units)	3
	045-0001-09	Lockwasher (Double Units)	6
21	002-0592-00	Dimmer Control Kit (Not Shown)	1

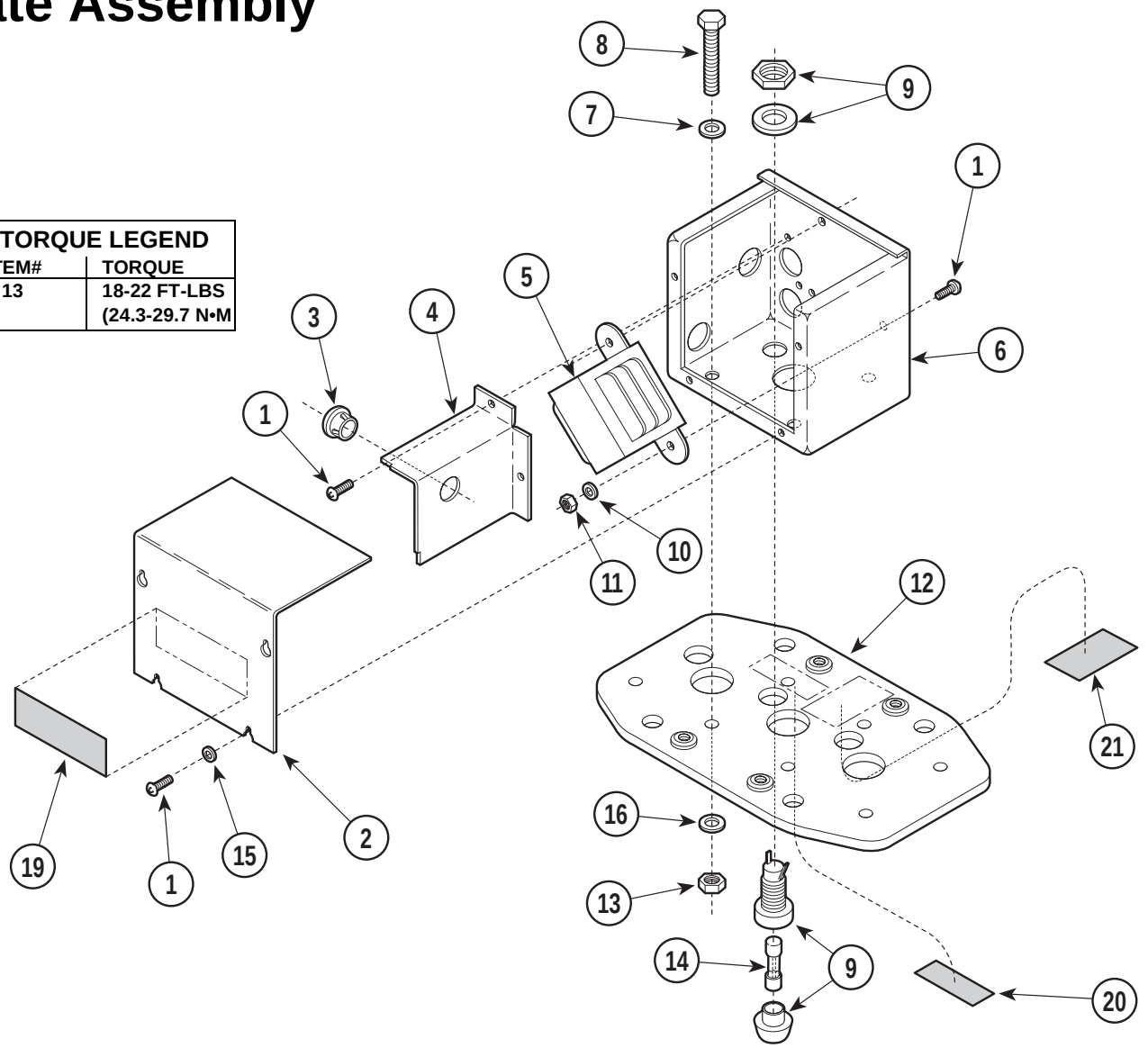
Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

Single Ceiling Plate Assembly

TORQUE LEGEND	
ITEM#	TORQUE
13	18-22 FT-LBS (24.3-29.7 N•M



MA319000

Used on units with Serial Number prefixes KN, KP, KS, KT, LY, LZ, MA, MB, MD, and ME

Item	Part No.	Description	Qty.
	029-1934-01	Ceiling Plate Assembly-Single (Includes Items 1 thru 18)	1
1	•040-0010-18	•Screw	9
2	•050-3591-00	•Junction Box Cover	1
3	•053-0068-01	•Snap Bushing	1
4	•050-3595-00	•Junction Box Divider	1
5	•002-0606-00	•Transformer Kit [120 VAC]	1
6	•050-3599-00	•Junction Box	1
7	•045-0001-49	•Washer	3
8	•040-0375-62	•Screw	3
9	•015-0969-00	•Fuse Holder Assembly (Includes Body, Cap, Washer and Nut)	1
10	•045-0001-04	•Lockwasher	2
11	•041-0010-00	•Nut	2
12	•030-1024-00	•Ceiling Plate Weldment	1
13	•041-0375-01	•Nut	3
14	•015-0346-08	•Fuse (3 amp)	1
15	•045-0001-31	•Lockwasher	2
16	•045-0001-09	•Lockwasher	3
17	•015-0013-00	•Cable Tie (Not Shown)	1
18	•015-1113-00	•Wire Nut - Grey (Not Shown)	2
	•800400	•Wire Nut - Orange (Not Shown)	5
19	561-0191-00	Electric Shock Label	1
20	061-0611-00	Fuse Replacement Label	1
21	561-0318-00	U.L. / C.U.L. Label	1

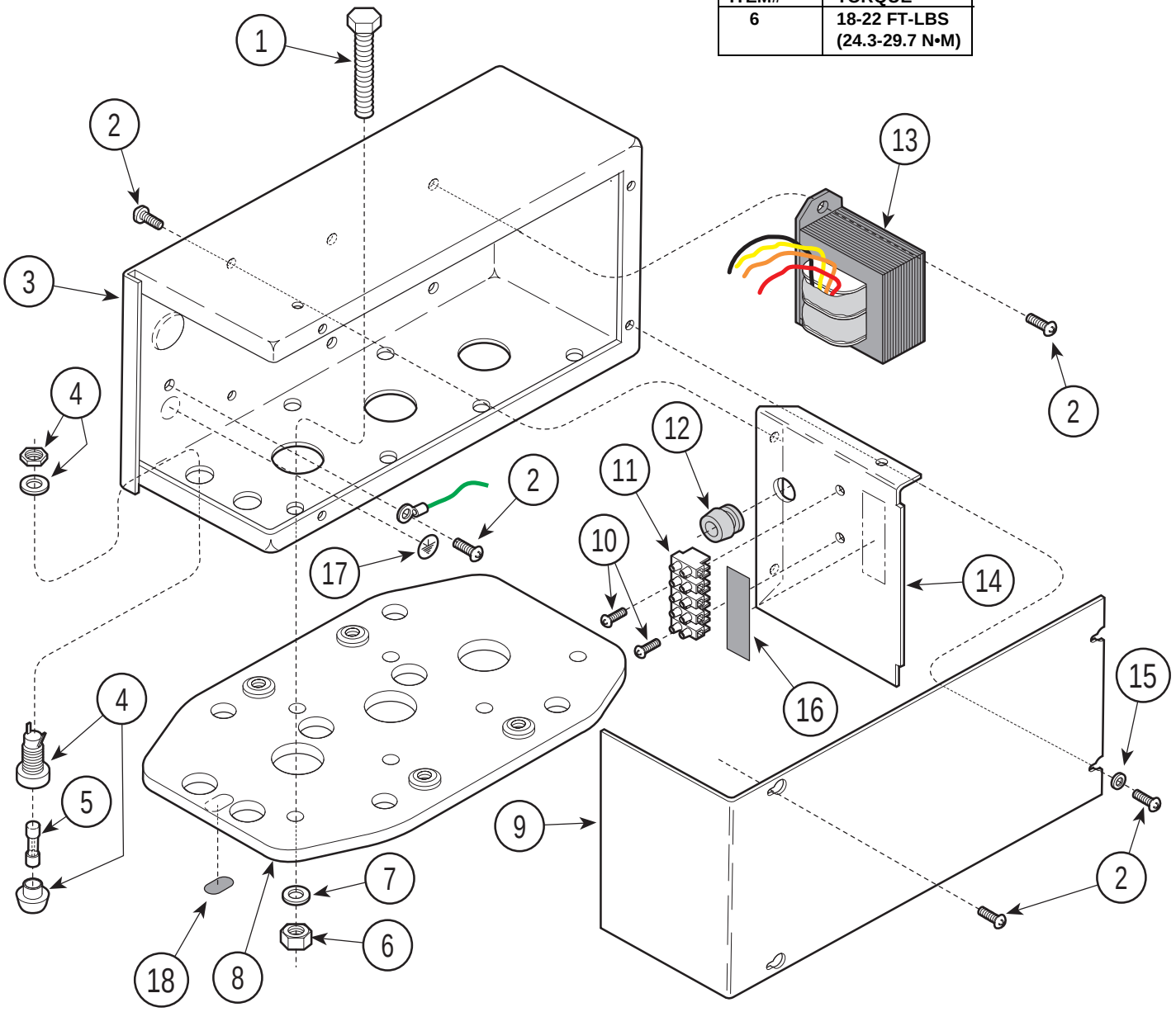
Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771 Rev. 4/01

Printed in U.S.A.

Single Ceiling Plate Assembly

TORQUE LEGEND	
ITEM#	TORQUE
6	18-22 FT-LBS (24.3-29.7 N•M)



MA552801f

Used on units with Serial Numbers MX1000 thru Present & MZ1000 thru Present

Item	Part No.	Description	Qty.
	029-2358-00	Ceiling Plate Assembly-Single (Includes Items 1 thru 15)	1
1	• 040-0375-62	• Screw	3
2	• 040-0010-18	• Screw	10
3	• 050-4586-00	• Junction Box	1
4	• 015-1259-01	• Fuse Holder Assembly (Includes Body, Cap, Washer and Nut)	1
5	• 015-0346-29	• Fuse (1.6 A. - 250 V.)	1
6	• 041-0375-01	• Nut	3
7	• 045-0001-09	• Lockwasher	3
8	• 030-1225-00	• Ceiling Plate Weldment	1
9	• 050-4587-00	• Junction Box Cover	1
10	• 040-0006-77	• Screw	2
11	• 015-1373-00	• Terminal Block	1
12	• 053-0068-07	• Snap Bushing	1
13	• 002-0606-00	• Transformer Kit	1
14	• 050-4588-00	• Junction Box Divider	1
15	• 045-0001-31	• Lockwasher	2
16	061-0748-00	Terminal Block Label - Single	1
17	061-0653-00	Earth (Ground) Label	1
18	061-0744-00	Fuse Replacement Label	1

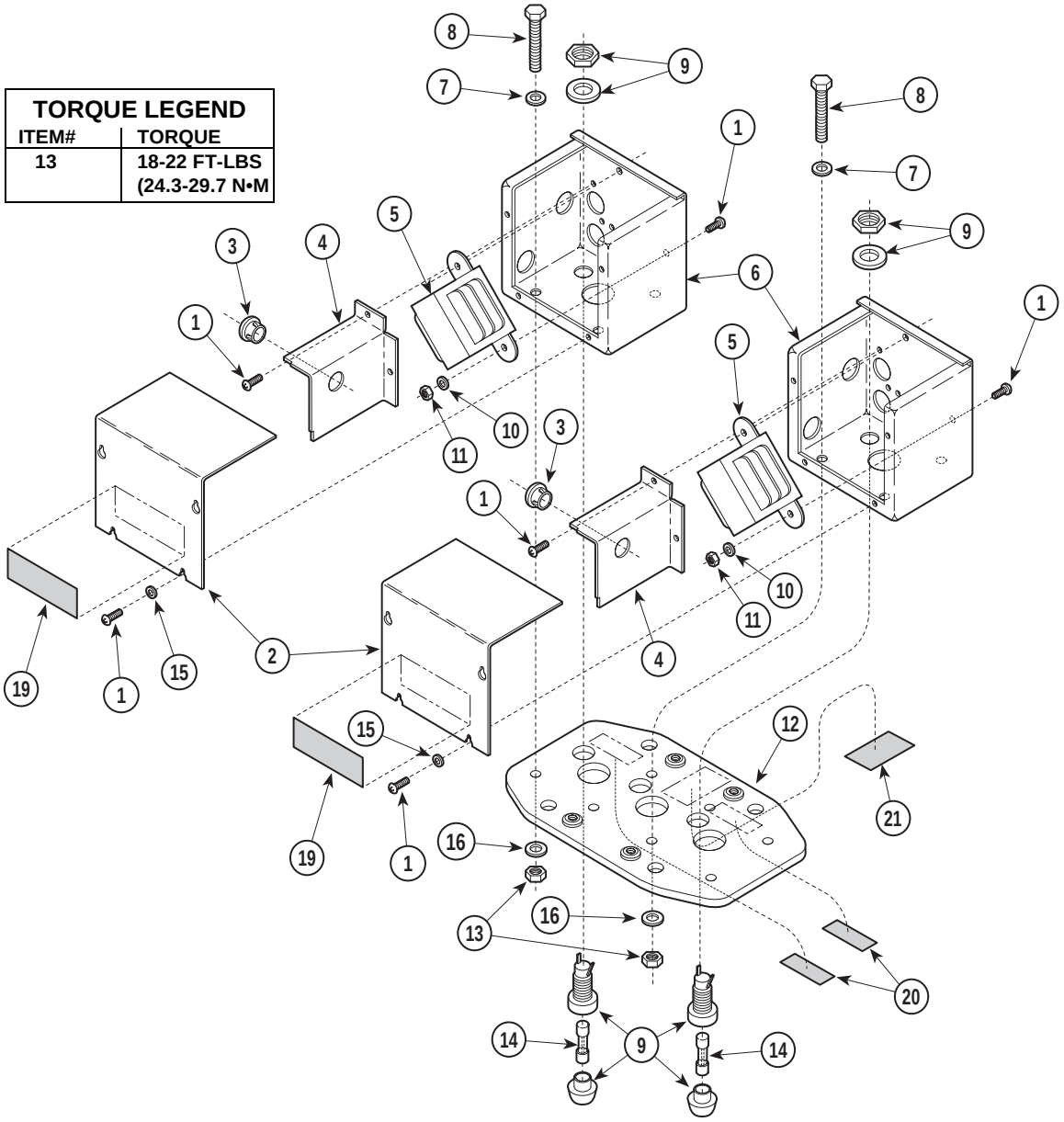
Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771 Rev. 4/01

Printed in U.S.A.

Double Ceiling Plate Assembly

TORQUE LEGEND	
ITEM#	TORQUE
13	18-22 FT-LBS (24.3-29.7 N•M



MA318900

Used on units with Serial Number prefixes KN, KP, KS, KT, LY, LZ, MA, MB, MD, and ME

Item	Part No.	Description	Qty.
	029-1949-01	Ceiling Plate Assembly-Double (Includes Items 1 thru 18)	1
1	• 040-0010-18	• Screw	18
2	• 050-3591-00	• Junction Box Cover	2
3	• 053-0068-01	• Snap Bushing	2
4	• 050-3595-00	• Junction Box Divider	2
5	• 002-0606-00	• Transformer Kit	2
6	• 050-3599-00	• Junction Box	2
7	• 045-0001-49	• Washer	6
8	• 040-0375-62	• Screw	6
9	• 015-0969-00	• Fuse Holder Assembly (Includes Body, Cap, Washer and Nut)	2
10	• 045-0001-04	• Lockwasher	4
11	• 041-0010-00	• Nut	4
12	• 030-1024-00	• Ceiling Plate Weldment	1
13	• 041-0375-01	• Nut	6
14	• 015-0346-08	• Fuse (3 amp)	2
15	• 045-0001-31	• Lockwasher	4
16	• 045-0001-09	• Lockwasher	6
17	• 015-0013-00	• Cable Tie (Not Shown)	2
18	• 015-1113-00	• Wire Nut - Grey (Not Shown)	4
	• 800400	• Wire Nut - Orange (Not Shown)	10
19	561-0191-00	Electric Shock Label	2
20	061-0611-00	Fuse Replacement Label	2
21	061-0318-00	U.L. / C.U.L. Label	1

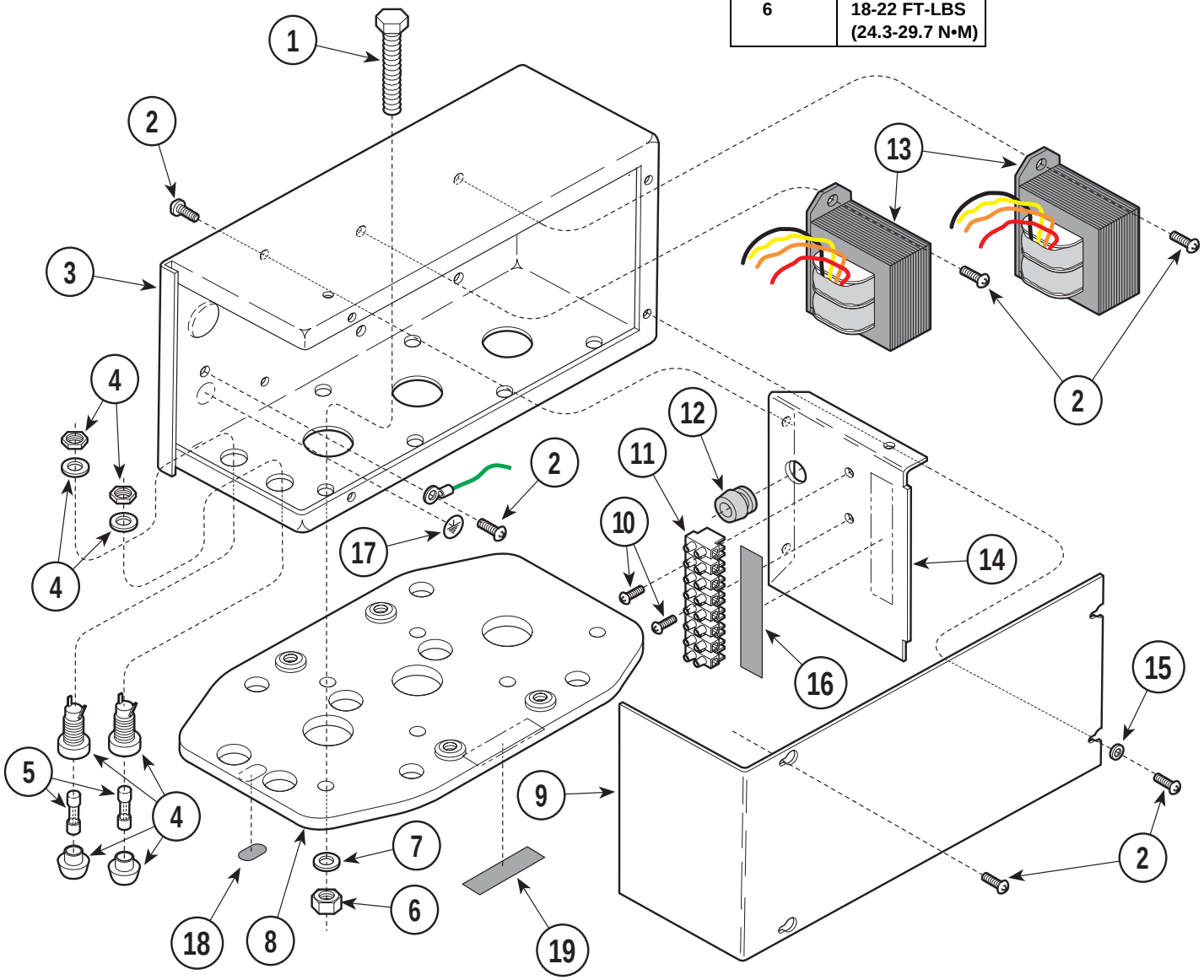
Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771 Rev. 4/01

Printed in U.S.A.

Double Ceiling Plate Assembly

TORQUE LEGEND	
ITEM#	TORQUE
6	18-22 FT-LBS (24.3-29.7 N•M)



MA552600

Used on units with Serial Numbers MX1000 thru Present & MZ1000 thru Present

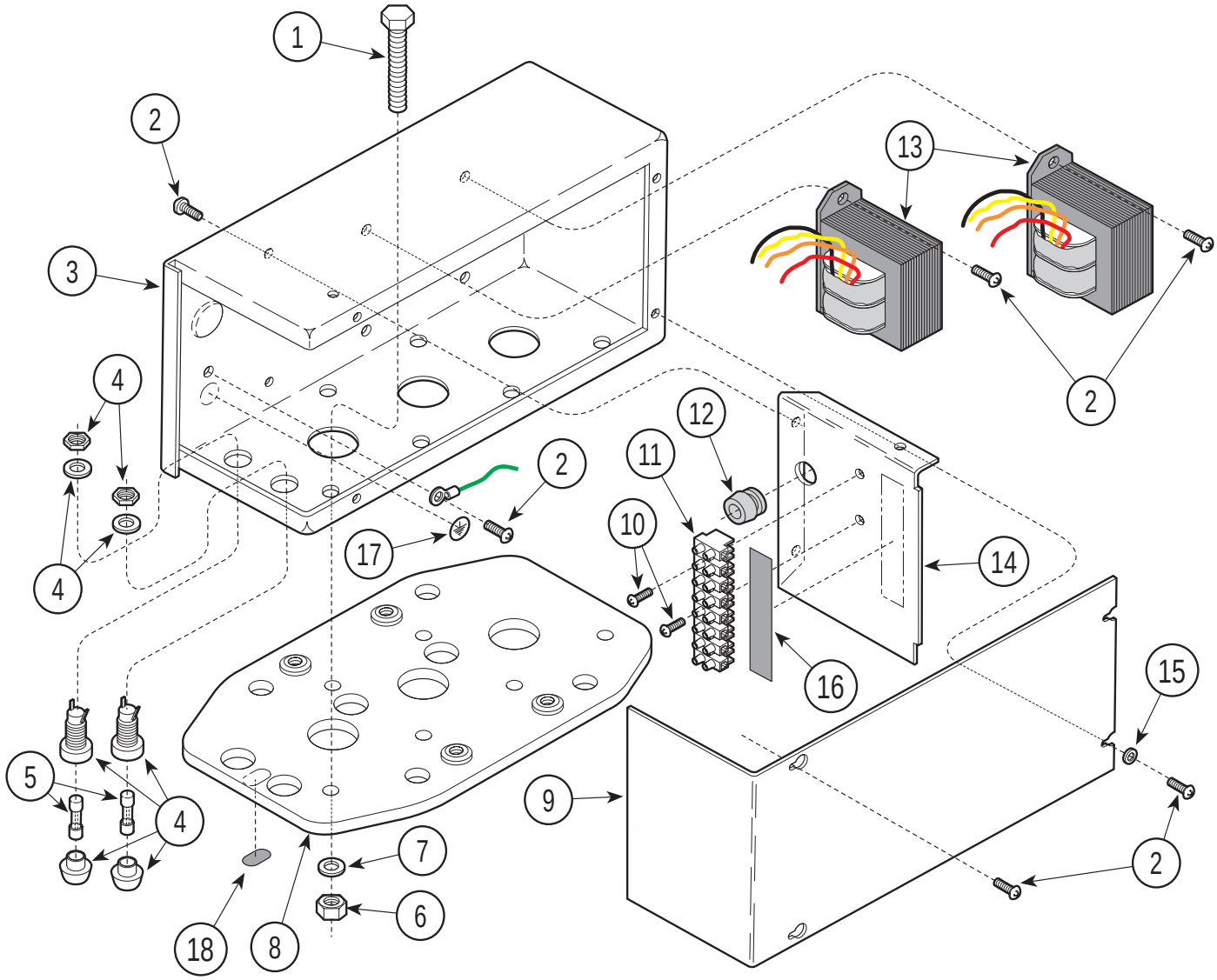
Item	Part No.	Description	Qty.
	029-2385-00	Ceiling Plate Assembly-Double (Includes Items 1 thru 15)	1
1	• 040-0375-62	• Screw	6
2	• 040-0010-18	• Screw	12
3	• 050-4586-00	• Junction Box	1
4	• 015-1259-01	• Fuse Holder Assembly (Includes Body, Cap, Washer and Nut)	2
5	• 015-0346-29	• Fuse (1.6 A. - 250 V.)	2
6	• 041-0375-01	• Nut	6
7	• 045-0001-09	• Lockwasher	6
8	• 030-1225-00	• Ceiling Plate Weldment	1
9	• 050-4587-00	• Junction Box Cover	1
10	• 040-0006-77	• Screw	2
11	• 015-1373-01	• Terminal Block	1
12	• 053-0068-07	• Snap Bushing	1
13	• 002-0606-00	• Transformer Kit	2
14	• 050-4588-00	• Junction Box Divider	1
15	• 045-0001-31	• Lockwasher	2
16	061-0745-00	Terminal Block Label - Double	1
17	061-0653-00	Earth (Ground) Label	1
18	061-0744-00	Fuse Replacement Label	1

Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771 Rev. 4/01

Printed in U.S.A.

Combination Ceiling Plate Assembly



MA318900Rev. 4

Used on units with Serial Number prefixes KN, KP, KS, KT, LY, LZ, MA, MB, MD, and ME

Item	Part No.	Description	Qty.
	029-1949-02	Ceiling Plate Assembly-Combination (Includes Items 1 thru 19)	1
1	• 040-0010-18	• Screw	18
2	• 050-3591-00	• Junction Box Cover	2
3	• 053-0068-01	• Snap Bushing	2
4	• 050-3595-00	• Junction Box Divider	2
5	• 002-0606-00	• Transformer Kit (354)	1
6	• 050-3599-00	• Junction Box	2
7	• 045-0001-49	• Washer	6
8	• 040-0375-62	• Screw	6
9	• 015-0969-00	• Fuse Holder Assembly (Includes Body, (Includes Body,	2
10	• 045-0001-04	• Lockwasher	4
11	• 041-0010-00	• Nut	4
12	• 030-1024-00	• Ceiling Plate Weldment	1
13	• 041-0375-01	• Nut	6
14	• 015-0346-08	• Fuse (3 amp)	2
15	• 045-0001-31	• Lockwasher	4
16	• 045-0001-09	• Lockwasher	6
17	• 002-0534-00	• Transformer Kit (355)	1
18	• 015-0013-00	• Cable Tie (Not Shown)	2
19	• 015-1113-00	• Wire Nut - Grey (Not Shown)	4
	• 800400	• Wire Nut - Orange (Not Shown)	10
20	561-0191-00	Electric Shock Label	2
21	061-0611-00	Fuse Replacement Label	2
22	561-0318-00	U.L. / C.U.L. Label	1

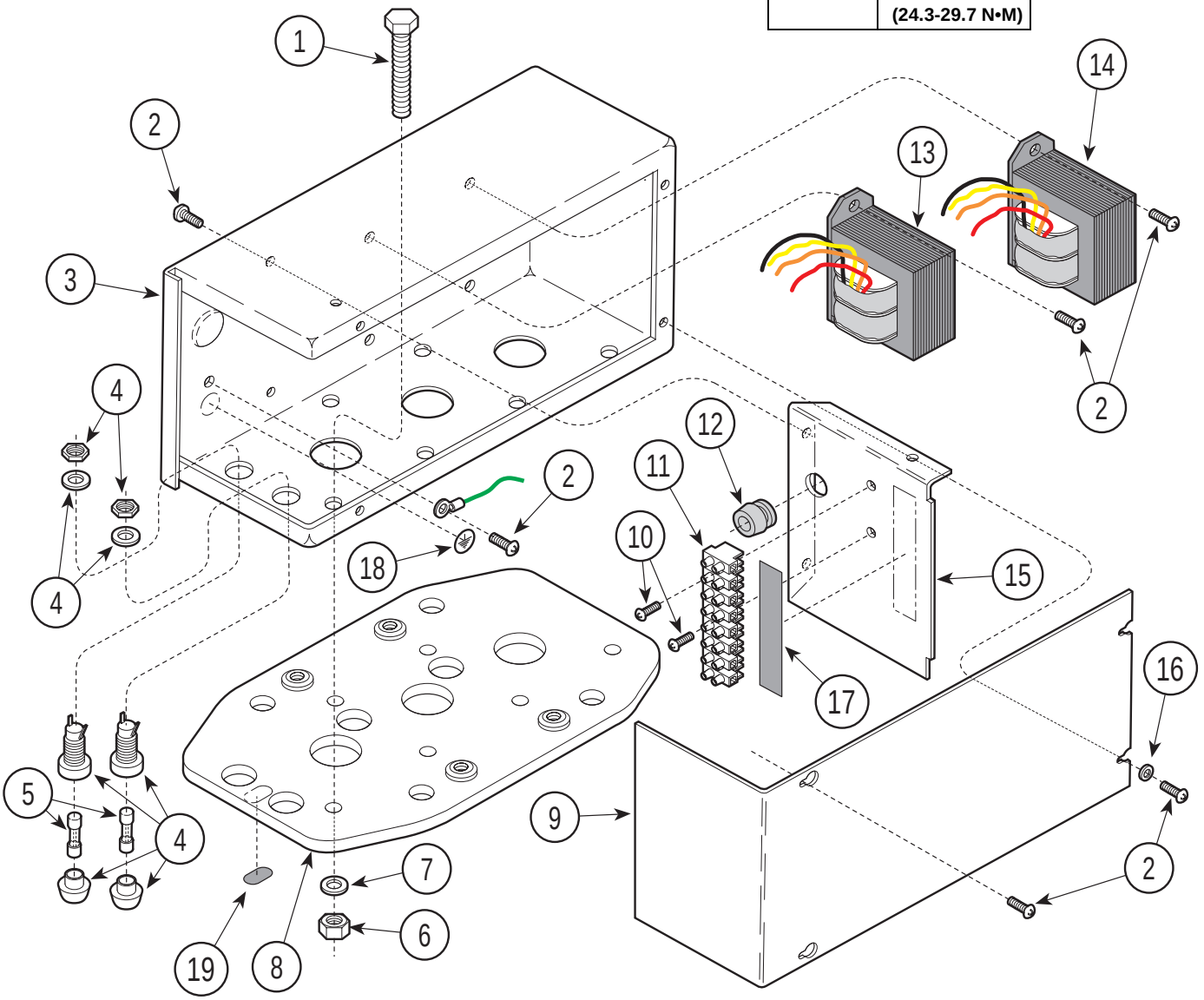
Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771 Rev. 4/01

Printed in U.S.A.

Combination Ceiling Plate Assembly

TORQUE LEGEND	
ITEM#	TORQUE
6	18-22 FT-LBS (24.3-29.7 N•M)



MA5527

Used on units with Serial Numbers MX1000 thru Present & MZ1000 thru Present

Item	Part No.	Description	Qty.
	029-2385-02	Ceiling Plate Assembly-Combination (Includes Items 1 thru 16)	1
1	• 040-0375-62	• Screw	6
2	• 040-0010-18	• Screw	12
3	• 050-4586-00	• Junction Box	1
4	• 015-1259-01	• Fuse Holder Assembly (Includes Body, Cap, Washer and Nut)	2
5	• 015-0346-29	• Fuse (1.6 A. - 250 V.)	2
6	• 041-0375-01	• Nut	6
7	• 045-0001-09	• Lockwasher	6
8	• 030-1225-00	• Ceiling Plate Weldment	1
9	• 050-4587-00	• Junction Box Cover	1
10	• 040-0006-77	• Screw	2
11	• 015-1373-01	• Terminal Block	1
12	• 053-0068-07	• Snap Bushing	1
13	• 002-0606-00	• Transformer Kit (354)	1
14	• 002-0642-00	• Transformer Kit (355)	1
15	• 050-4588-00	• Junction Box Divider	1
16	• 045-0001-31	• Lockwasher	2
17	061-0745-00	Terminal Block Label - Double	1
18	061-0653-00	Earth (Ground) Label	1
19	061-0744-00	Fuse Replacement Label	1
20	561-0747-00	C.U.S. Label	1

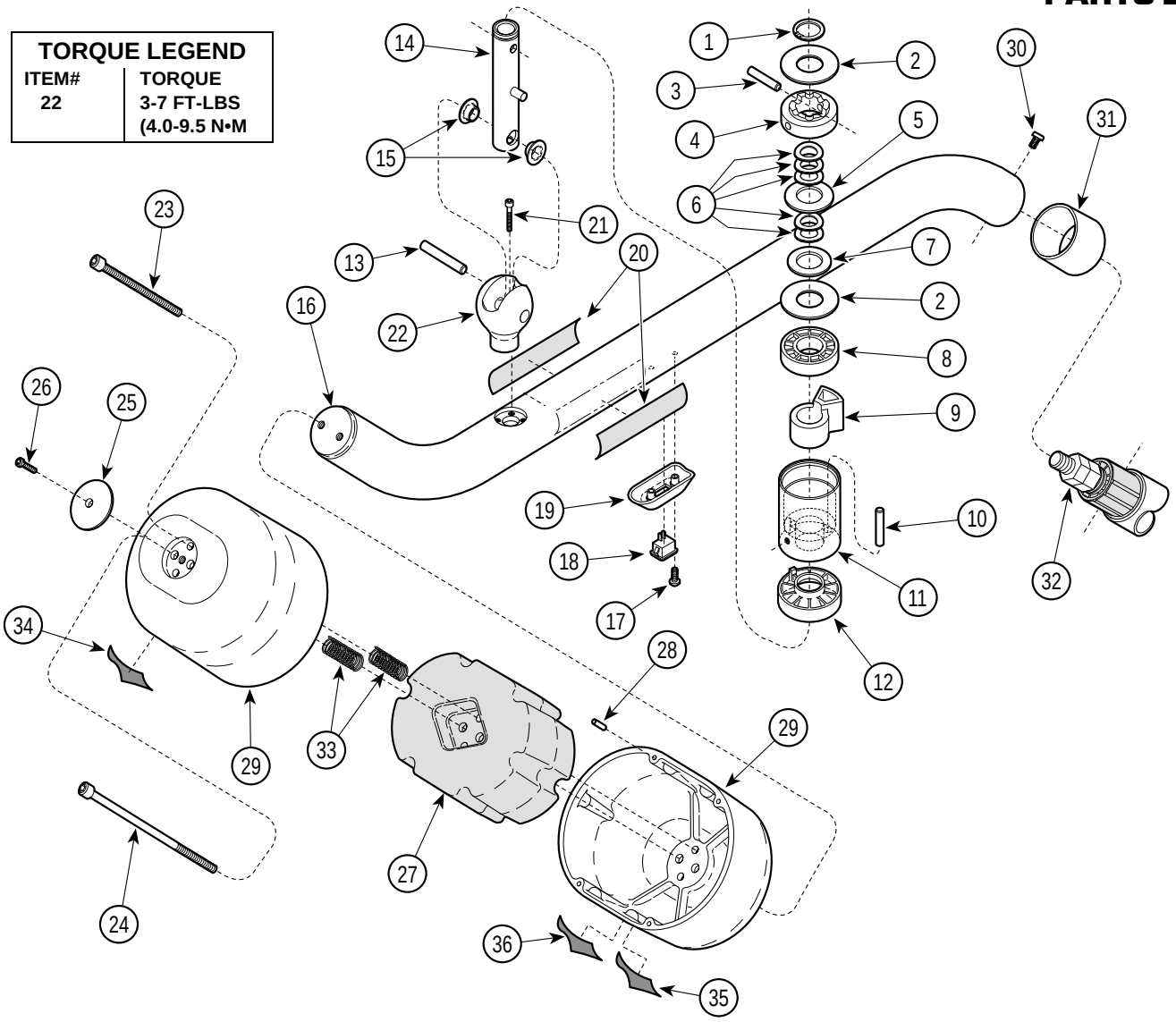
Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771 Rev. 4/01

Printed in U.S.A.

Cross Tube Assembly

TORQUE LEGEND	
ITEM#	TORQUE
22	3-7 FT-LBS (4.0-9.5 N•M



MA3187

Used on units with Serial Number KN1000 thru KN1005, KP1000 thru KP1011, KS1000 thru KS1003 & KT1000 thru KT1003

Item	Part No.	Description	Qty.
	029-1920-00	Cross Tube Assembly (Includes Items 1 thru 22)	1
1	•042-0101-05	•Retaining Ring	1
2	•045-0001-111	•Washer	2
3	•042-0157-01	•Groove Pin	1
4	•057-0414-00	•Ball Pivot Cam	1
5	•045-0001-112	•Washer	1
6	•045-0001-110	•Wave Washer	4
7	•016-0671-00	•DU Thrust Washer	1
8	•053-0800-00	•Ball Pivot Bearing	1
9	•002-0562-00	•Ball Pivot Stop Kit (Includes Items 3 and 15)	1
10	•042-0157-00	•Groove Pin	1
11	•057-0413-00	•Ball Pivot Housing	1
12	•053-0798-00	•Ball Pivot Brake	1
13	•042-0157-03	•Groove Pin	1
14	•030-1074-00	•Ball Pivot Shaft Weldment	1
15	•016-0392-07	•DU Flange Bearing	2
16	•002-0619-00	•Cross Tube Weldment Kit	1
17	•020-0168-00	•Ballast Housing	2
18	•042-0157-04	•Groove Pin	4
19	•020-0169-00	•Ballast	1
20	•525-0024-11	•Spring	3
21	•040-0250-144	•Screw	1
22	•040-0312-57	•Screw	2
23	053-0810-00	Housing Cap	1
24	040-0010-70	Screw	1
25	053-0812-00	Switch Bezel	1
26	015-1086-00	Rocker Switch	1
27	040-0006-80	Screw	2
28	040-0010-131	Screw	2
29	053-0802-00	Common Pivot Sleeve	1
30		Lamp Tube (Refer to "Lamp Tube Assembly" Elsewhere)	Ref.
31	061-0708-00	Ritter 354 Model Label	2
	061-0732-00	Midmark 354 Model Label	2
32		Serial Number Label	Ref.

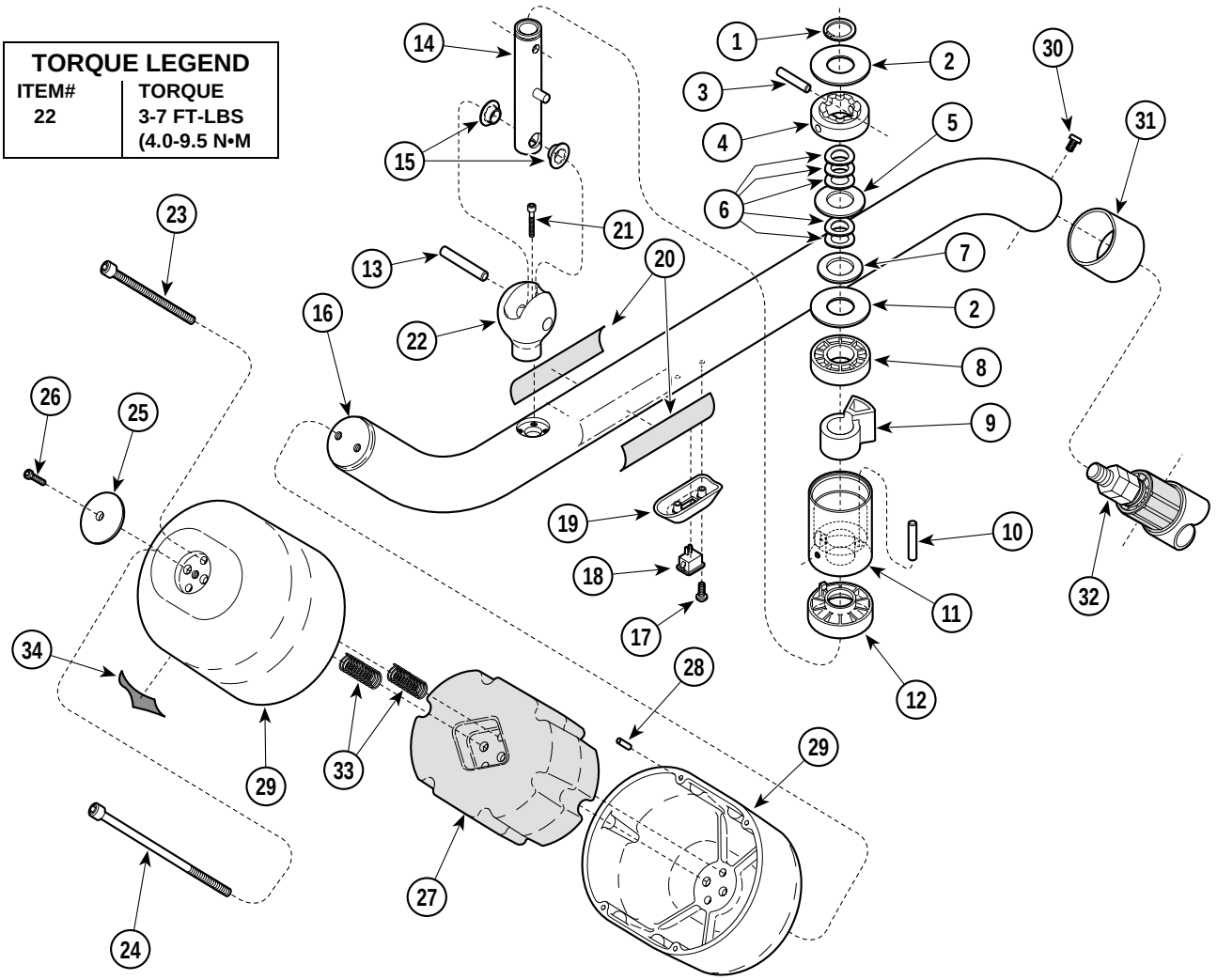
Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771 Rev. 4/01

Printed in U.S.A.

Cross Tube Assembly

TORQUE LEGEND	
ITEM#	TORQUE
22	3-7 FT-LBS (4.0-9.5 N•M



MA318701

Used on units with Serial Number KN1006, KP1012, KS1004, KT1004, LY1000, LZ1000, MA1000, MB1000, MD1001, ME1000 thru Present & MX1000 thru MX1112, MZ1000 thru MZ1167

Item	Part No.	Description	Qty.
	002-0616-00	Cross Tube Assembly (Includes Items 1 thru 22)	1
1	•042-0101-05	•Retaining Ring	1
2	•045-0001-111	•Washer	2
3	•042-0157-01	•Groove Pin	1
4	•057-0414-00	•Ball Pivot Cam	1
5	•045-0001-112	•Washer	1
6	•045-0001-110	•Wave Washer	5
7	•016-0671-00	•DU Thrust Washer	1
8	•053-0800-00	•Ball Pivot Bearing	1
9	•002-0562-00	•Ball Pivot Stop Kit (Includes Items 3 and 15)	1
10	•042-0157-00	•Groove Pin	1
11	•057-0413-00	•Ball Pivot Housing	1
12	•053-0798-00	•Ball Pivot Brake	1
13	•042-0157-03	•Groove Pin ***(Not Reusable)***	1
14	•030-1074-00	•Ball Pivot Shaft Weldment	1
15	•016-0392-07	•DU Flange Bearing	2
16	•002-0619-00	•Cross Tube Weldment Kit (Incl. 22)	1
17	•040-0006-80	•Screw	2
18	•015-1086-00	•Rocker Switch	1
19	•053-0812-00	•Switch Bezel	1
20	•061-0708-00	•Ritter 354 Model Label	2
	•061-0732-00	•Midmark 354 Model Label	2
21	•118653	•Screw (Apply Loctite #042-0025-00)	4
22	•	•Ball Pivot (Part of Item 16)	1
23	040-0250-144	Screw	1
24	040-0312-57	Screw	2
25	053-0810-00	Housing Cap	1
26	040-0010-70	Screw	1
27	020-0169-00	Ballast	1
28	042-0157-04	Groove Pin	4
29	020-0168-00	Ballast Housing	2
30	040-0010-131	Screw	2
31	053-0802-00	Common Pivot Sleeve	1
32		Lamp Tube (Refer to "Lamp Tube Assembly" Elsewhere)	Ref.
33	525-0024-11	Spring	3
34		Serial Number Label	Ref.

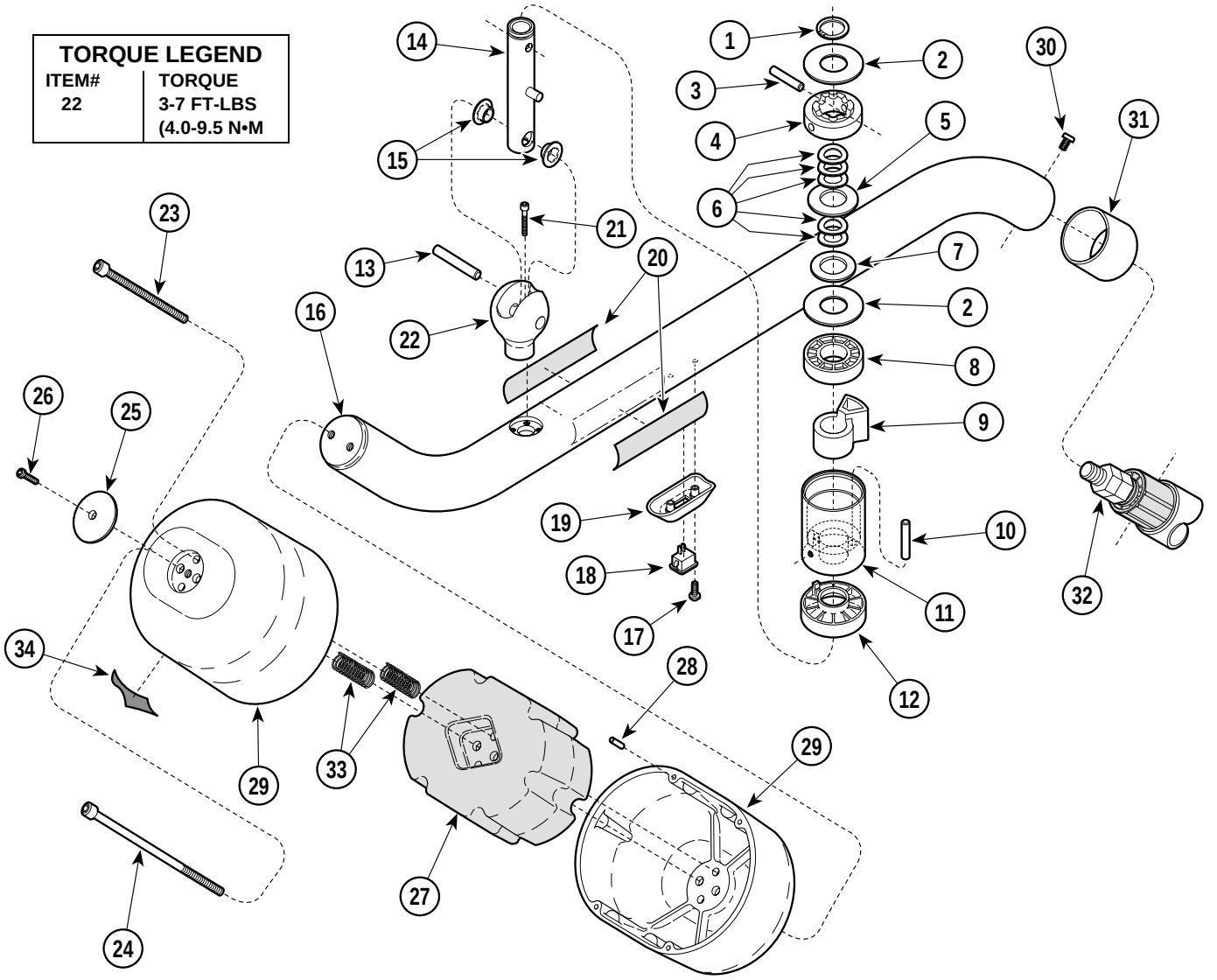
Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771 Rev. 1/03

Printed in U.S.A.

Cross Tube Assembly

TORQUE LEGEND	
ITEM#	TORQUE
22	3-7 FT-LBS (4.0-9.5 N•M



MA318701

Used on units with Serial Number MX1113 & MZ1168 thru Present

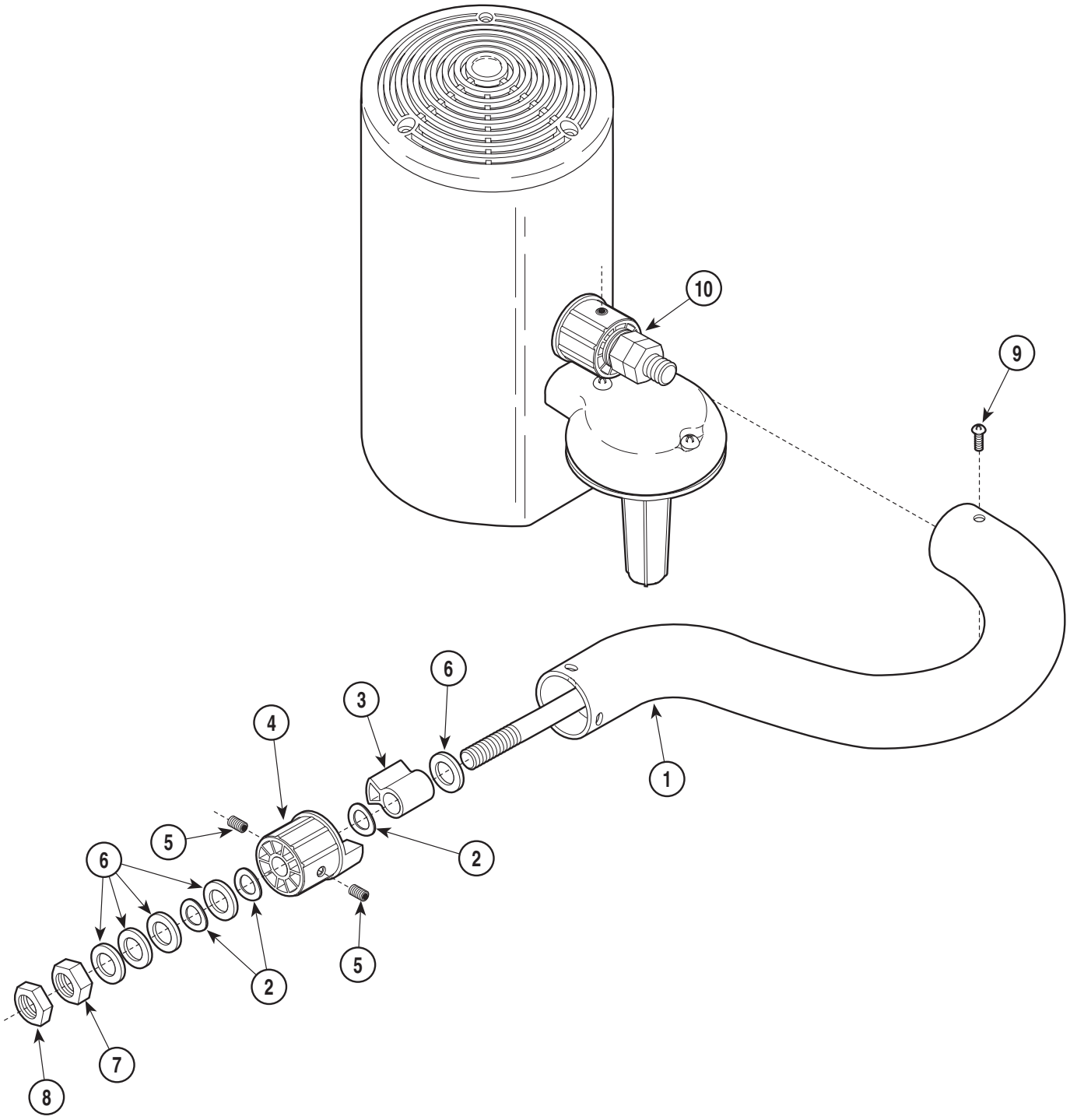
Item	Part No.	Description	Qty.
	002-0616-00	Cross Tube Assembly (Includes Items 1 thru 22)	1
1	•042-0101-05	•Retaining Ring	1
2	•045-0001-111	•Washer	2
3	•042-0157-01	•Groove Pin	1
4	•057-0414-00	•Ball Pivot Cam	1
5	•045-0001-112	•Washer	1
6	•045-0001-110	•Wave Washer	5
7	•016-0671-00	•DU Thrust Washer	1
8	•053-0800-00	•Ball Pivot Bearing	1
9	•002-0562-00	•Ball Pivot Stop Kit (Includes Items 3 and 15)	1
10	•042-0157-00	•Groove Pin	1
11	•057-0766-00	•Ball Pivot Housing	1
12	•053-0798-00	•Ball Pivot Brake	1
13	•042-0157-03	•Groove Pin ***(Not Reusable)***	1
14	•030-1074-00	•Ball Pivot Shaft Weldment	1
15	•016-0392-07	•DU Flange Bearing	2
16	•002-0619-00	•Cross Tube Weldment Kit (Incl. 22)	1
17	•040-0006-80	•Screw	2
18	•015-1086-00	•Rocker Switch	1
19	•053-0812-00	•Switch Bezel	1
20	•061-0708-00	•Ritter 354 Model Label	2
	•061-0732-00	•Midmark 354 Model Label	2
21	•118653	•Screw (Apply Loctite #042-0025-00)	4
22	•	•Ball Pivot (Part of Item 16)	1
23	040-0250-144	Screw	1
24	040-0312-57	Screw	2
25	053-0810-00	Housing Cap	1
26	040-0010-70	Screw	1
27	020-0169-00	Ballast	1
28	042-0157-04	Groove Pin	4
29	020-0168-00	Ballast Housing	2
30	040-0010-131	Screw	2
31	053-0802-00	Common Pivot Sleeve	1
32		Lamp Tube (Refer to "Lamp Tube Assembly" Elsewhere)	Ref.
33	525-0024-11	Spring	3
34		Serial Number Label	Ref.

Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

Lamp Tube Assembly



MA4599

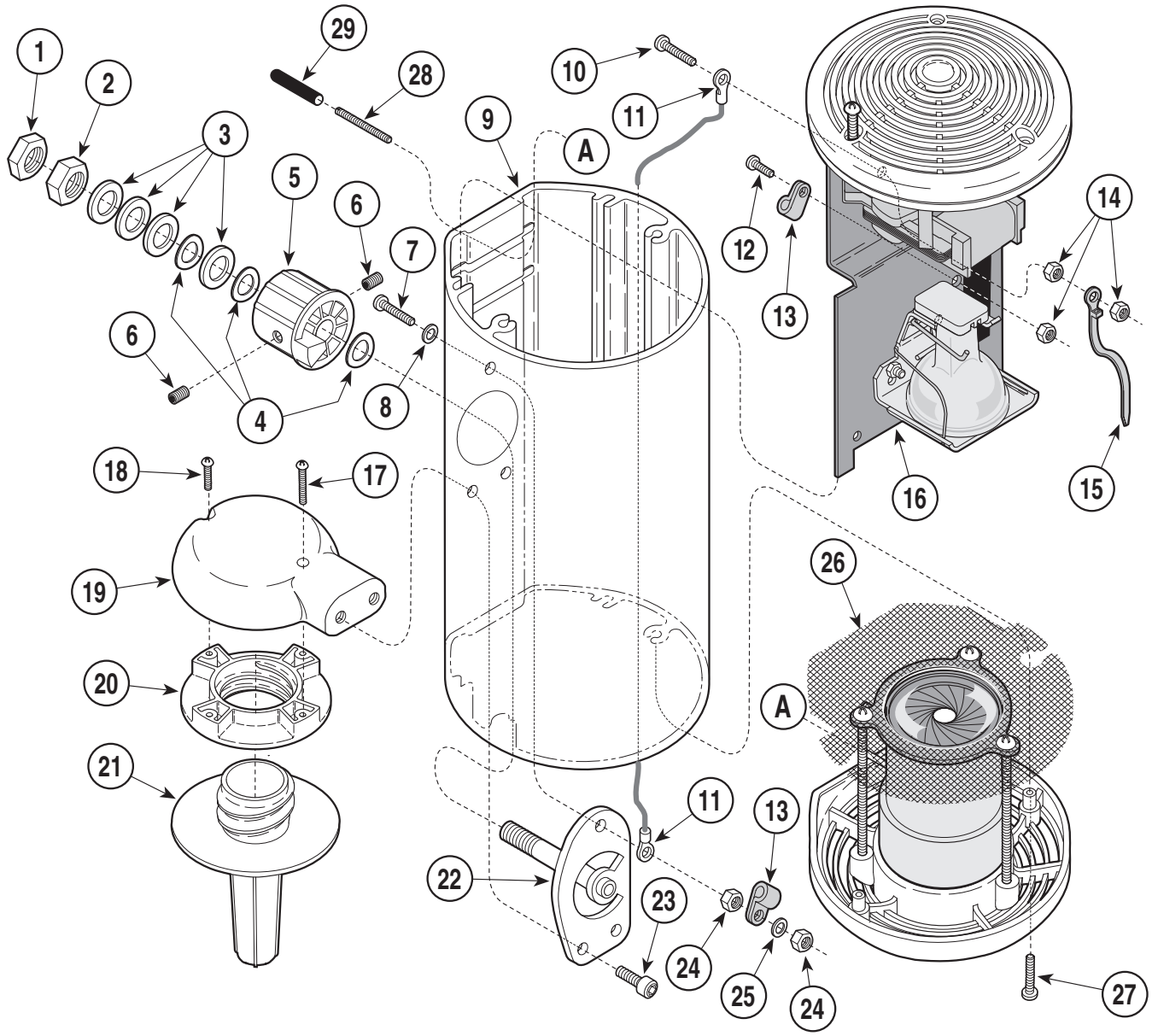
Item	Part No.	Description	Qty.
	029-2162-00	Lamp Tube Assembly (Includes Items 1 thru 8)	1
1	• 030-1137-00	• Lamp Tube Weldment (Includes Groove Pin)	1
2	• 045-0001-109	• Wave Washer	3
3	• 053-0811-00	• Cross Pivot Stop	1
4	• 053-0801-01	• Common Pivot Bearing	1
5	• 042-0158-00	•Form-Lok Insert	2
6	• 045-0001-107	• Washer	5
7	• 041-0500-04	• Hex Nut	1
8	• 041-0500-09	• Nut	1
9	040-0010-124	Screw	2
10		Lighthead Assembly (Refer to "Lighthead Assembly" Elsewhere)	Ref

Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771 Rev. 8/03

Printed in U.S.A.

Lighthead Assembly



MA456200

Used on units with Serial Number prefixes KN, KP, KS, KT, LY, LZ, MA, MB, MD, and ME

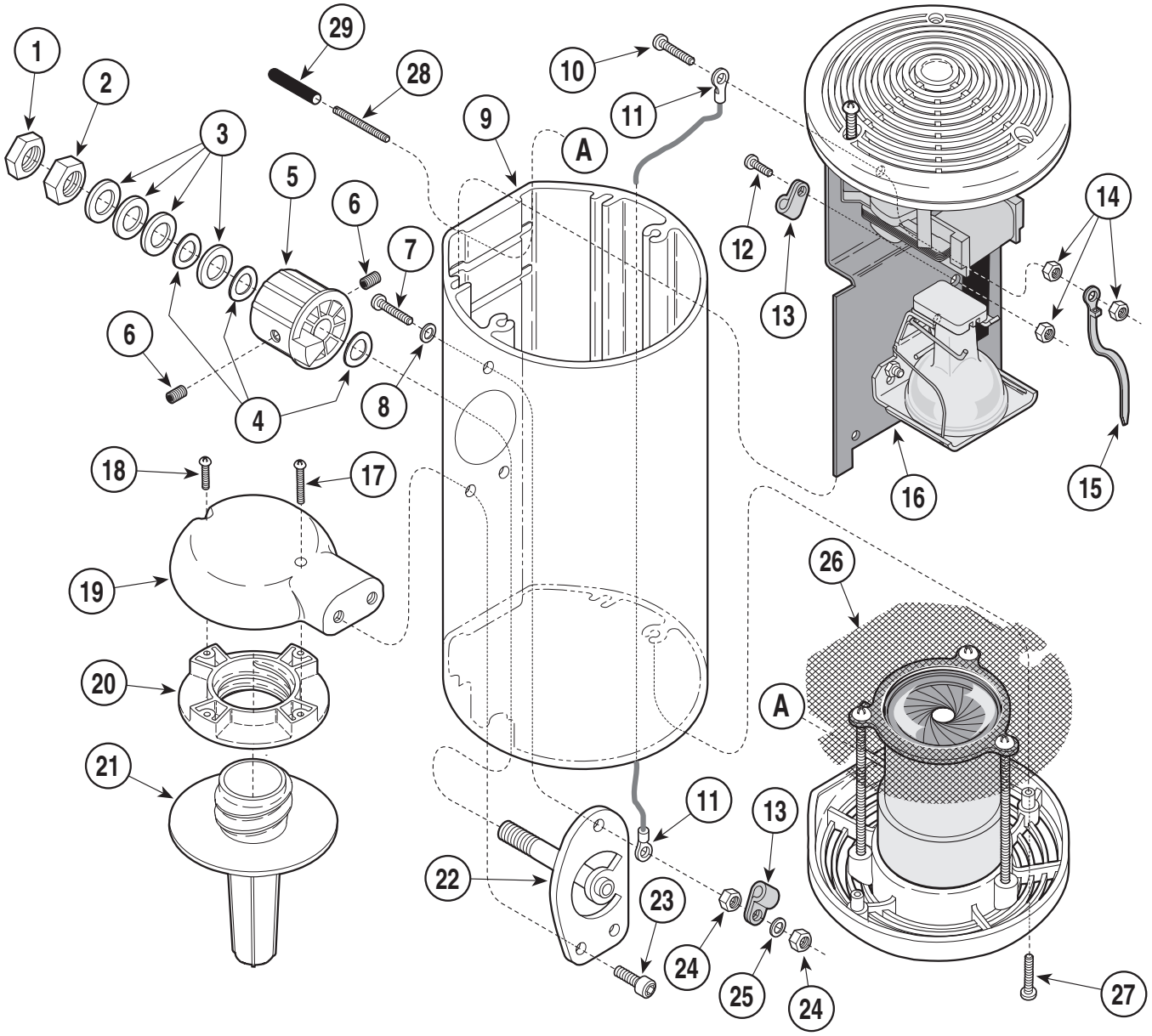
Item	Part No.	Description	Qty.
	029-2159-00	Model 354 Lighthead Assembly (Includes Items 1 thru 27)	1
1	• 041-0500-09	• Nut	1
2	• 041-0500-04	• Hex Nut	1
3	• 045-0001-107	• Washer	4
4	• 045-0001-109	• Spring Washer	3
5	• 053-0801-01	• Common Pivot Bearing	1
6	• 042-0158-00	• Form-Lok Insert	2
7	• 040-0010-137	• Screw	1
8	• 045-0001-08	• Lockwasher	1
9	• 021-0029-00	• Outer Housing	1
10	• 040-0006-78	• Screw	1
11	• 016-0772-00	• Lanyard	1
12	• 040-0006-27	• Screw	1
13	• 015-0371-01	• Cable Clamp	2
14	• 041-0006-00	• Hex Nut	3
15	• 015-0017-00	• Cable Tie	1
16	•	• Bulb Carriage Assembly (Refer to “Bulb Carriage Assembly” Elsewhere)	Ref.
17	• 040-0006-89	• Screw	1
18	• 040-0006-88	• Screw	1
19	• 020-0187-00	• Handle Mount	1
20	• 053-0743-00	• Handle Adapter	1
21	• 053-0724-00	• Sterilizable Handle	1
22	• 030-1138-00	• Pivot Weldment	1
23	• 040-0010-90	• Screw	2
24	• 041-0010-00	• Hex Nut	2
25	• 045-0001-00	• Washer	1
26	•	• Optic Assembly (Refer to “Optic Assembly” Elsewhere)	Ref.
27	• 040-0006-55	• Screw	2
28	• 040-0004-20	• Slotted Set Screw	2
29	• 053-0268-03	• Vinyl End Cap	2

Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771 Rev. 8/03

Printed in U.S.A.

Lighthead Assembly



MA456200

Used on units with Serial Numbers MX1000 thru Present & MZ1000 thru Present

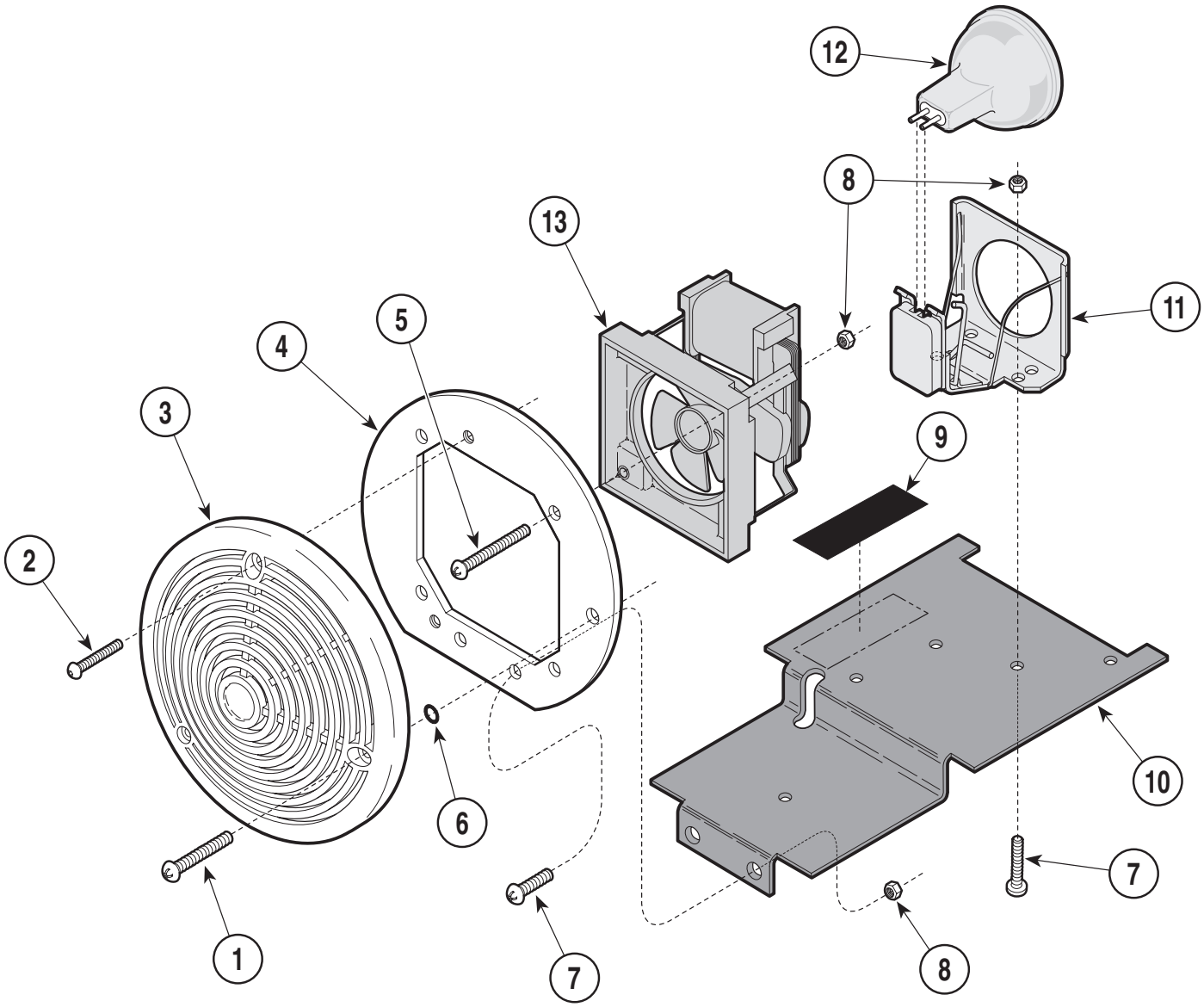
Item	Part No.	Description	Qty.
	029-2395-00	Model 354 Lighthead Assembly (Includes Items 1 thru 30)	1
1	• 041-0500-09	• Nut	1
2	• 041-0500-04	• Hex Nut	1
3	• 045-0001-107	• Washer	4
4	• 045-0001-109	• Spring Washer	3
5	• 053-0801-01	• Common Pivot Bearing	1
6	• 042-0158-00	• Form-Lok Insert	2
7	• 040-0010-137	• Screw	1
8	• 045-0001-08	• Lockwasher	1
9	• 021-0029-00	• Outer Housing	1
10	• 040-0006-78	• Screw	1
11	• 016-0772-00	• Lanyard	1
12	• 040-0006-27	• Screw	1
13	• 015-0371-01	• Cable Clamp	2
14	• 041-0006-00	• Hex Nut	3
15	• 015-0017-00	• Cable Tie	1
16	•	• Bulb Carriage Assembly (Refer to “Bulb Carriage Assembly” Elsewhere)	Ref.
17	• 040-0006-89	• Screw	1
18	• 040-0006-88	• Screw	1
19	• 020-0187-00	• Handle Mount	1
20	• 053-0743-00	• Handle Adapter	1
21	• 053-0724-00	• Sterilizable Handle	1
22	• 030-1138-00	• Pivot Weldment	1
23	• 040-0010-90	• Screw	2
24	• 041-0010-00	• Hex Nut	2
25	• 045-0001-00	• Washer	1
26	•	• Optic Assembly (Refer to “Optic Assembly” Elsewhere)	Ref.
27	• 040-0006-55	• Screw	2
28	• 040-0004-20	• Slotted Set Screw	2
29	• 053-0268-03	• Vinyl End Cap	2
30	• 015-1146-01	• Silicone/Fiberglass Sleeving (N/S)	13”

Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771 Rev. 8/03

Printed in U.S.A.

Bulb Carriage Assembly



MA456100

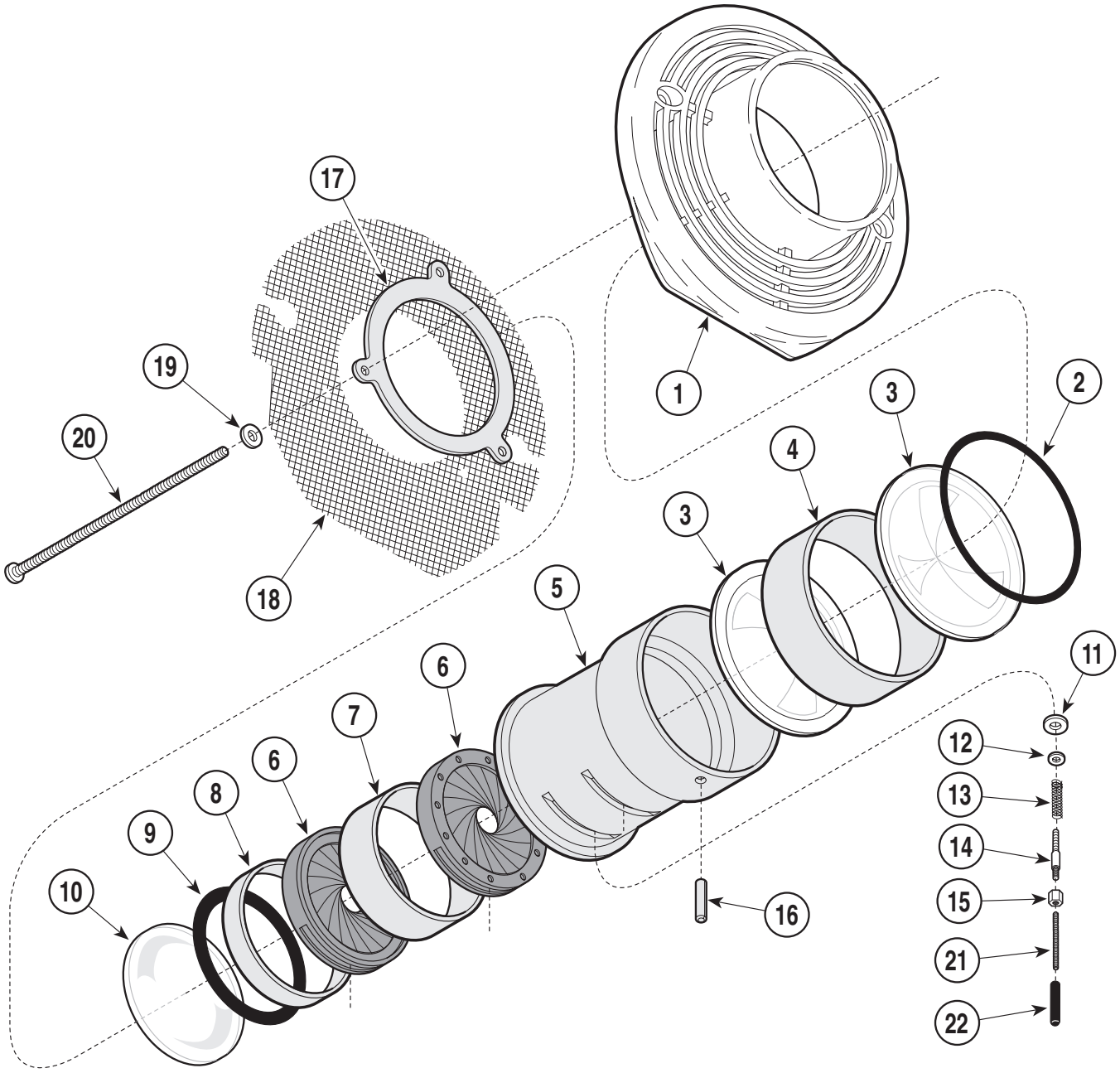
Item	Part No.	Description	Qty.
	029-2165-00	Bulb Carriage Assembly (Includes Items 1 thru 13)	1
1	• 040-0008-31	• Screw	1
2	• 040-0006-86	• Screw	2
3	• 053-0925-00	• Top Cap	1
4	• 050-4024-00	• Adapter Plate	1
5	• 040-0006-42	• Screw	4
6	• 014-0176-36	• O-Ring	1
7	• 040-0006-27	• Screw	4
8	• 041-0006-00	• Hex Nut	8
9	• 061-0707-00	• Relamp Label	1
10	• 050-4023-00	• Base Mount	1
11	• 015-0921-00	• Lamp Holder with Socket	1
12	• 002-0605-00	• Lamp Replacement Kit	1
13	• 015-1213-00	• Fan (20 VAC)	1

Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

Optic Assembly



MA456000

Used on units with Serial Number prefixes KN, KP, KS, KT, LY, LZ, MA, MB, MD, and ME

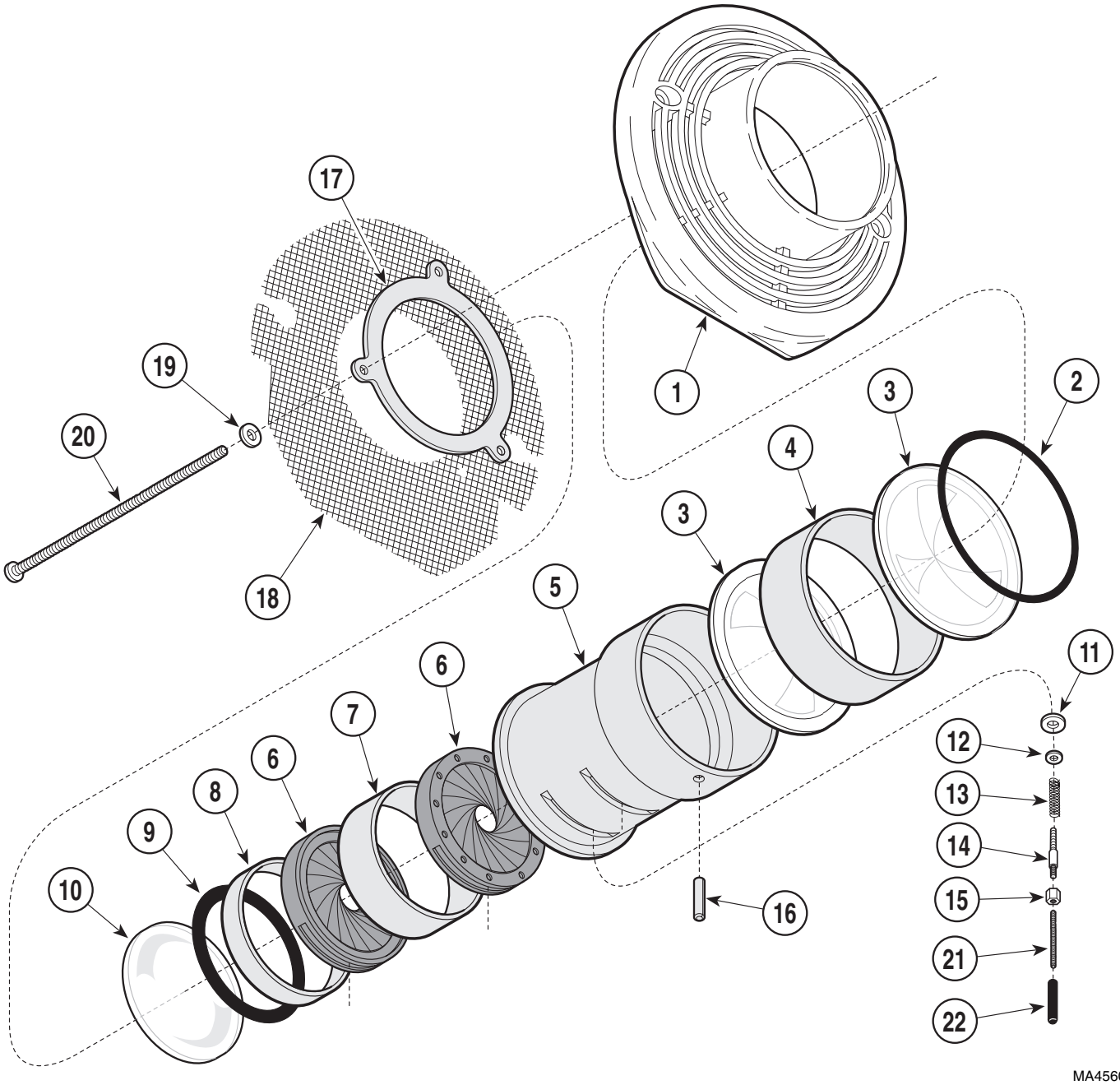
Item	Part No.	Description	Qty.
	029-2187-00	Optic Assembly (Includes Items 1 thru 20)	1
1	• 053-0949-00	• Front Cover	1
2	• 014-0176-39	• O-Ring	1
3	• 053-0942-00	• Lens	2
4	• 052-0307-00	• Lens Spacer	1
5	• 052-0309-00	• Optic Housing	1
6	• 016-0751-00	• 50 MM Iris Diaphragm(Apply Graphite Lubricant Spray #064-0020-00)	2
7	• 052-0308-00	• Iris Spacer	1
8	• 052-0321-00	• Cover Spacer	1
9	• 014-0176-38	• O-Ring	1
10	• 053-0956-00	• Cover Glass	1
11	• 045-0001-93	•Washer	2
12	• 045-0001-120	• Washer	2
13	• 525-0024-14	• Spring	2
14	• 057-0505-00	• Iris Lever Shank	2
15	• 041-0036-00	• Coupling Hex Nut	2
16	• 505-703705	• Roll Pin	1
17	• 050-4025-00	• Retaining Disk	1
18	• 016-0753-00	• Screen	1
19	• 045-0001-21	• Washer	3
20	• 040-0006-87	• Screw	3
21		Set Screw (Refer to “Lighthead Assembly” Elsewhere)	Ref.
22		Vinyl End Cap (Refer to “Lighthead Assembly” Elsewhere)	Ref.

Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

Optic Assembly



MA45600

Used on units with Serial Numbers MX1000 thru Present & MZ1000 thru Present

Item	Part No.	Description	Qty.
	029-2394-00	Optic Assembly (Includes Items 1 thru 20)	1
1	• 053-0949-00	• Front Cover	1
2	• 014-0176-39	• O-Ring	1
3	• 053-0942-00	• Lens	2
4	• 052-0307-00	• Lens Spacer	1
5	• 052-0309-00	• Optic Housing	1
6	• 016-0751-00	• 50 MM Iris Diaphragm(Apply Graphite Lubricant Spray #064-0020-00)	2
7	• 052-0308-00	• Iris Spacer	1
8	• 052-0321-00	• Cover Spacer	1
9	• 014-0176-38	• O-Ring	1
10	• 053-1045-00	• Cover Glass - Color Corrected	1
11	• 045-0001-93	•Washer	2
12	• 045-0001-120	• Washer	2
13	• 525-0024-14	• Spring	2
14	• 057-0505-00	• Iris Lever Shank	2
15	• 041-0036-00	• Coupling Hex Nut	2
16	• 505-703705	• Roll Pin	1
17	• 050-4025-00	• Retaining Disk	1
18	• 016-0753-00	• Screen	1
19	• 045-0001-21	• Washer	3
20	• 040-0006-87	• Screw	3
21		Set Screw (Refer to “Lighthead Assembly” Elsewhere)	Ref.
22		Vinyl End Cap (Refer to “Lighthead Assembly” Elsewhere)	Ref.

Always Specify Model & Serial Number

© Midmark Corporation 2000 SF-1771

Printed in U.S.A.

COMMENTS

The Technical Publications Department of Midmark Corporation takes pride in its publications. We are sure that our manuals will fill all of your needs when you are performing scheduled maintenance, servicing, or repairs on a Midmark product.

However, if you find any errors or feel that there should be a change, addition, or deletion to a manual, please let us know!

Page(s) and Paragraph(s) Needing Changed:

Description of Error or Desired Change:

Please fax or mail a copy of this completed comment sheet to:

Midmark Corporation
ATTN: Technical Publications Department
60 Vista Drive
Versailles, Ohio 45380
Fax: (937) 526-5542

© Midmark Corporation 2000 SF-1621

Printed in U.S.A.

Return To Table Of Contents

FAX ORDERING FORM

(SERVICE PARTS ONLY)

NOTES:

- **ALL BLOCKED AREAS MUST BE COMPLETED.**
- **USE FOR NON-WARRANTY FAX ORDERS ONLY. WARRANTY ORDERS MUST BE TELEPHONED IN (1-800-MIDMARK).**

ATTENTION: SERVICE DEPARTMENT FAX#: 877-249-1793

ACCT #: _____ **P.O. #:** _____ **DATE:** _____

NAME: _____ **SHIP TO:** _____

ADDRESS: _____

CITY, ST.: _____

CONTACT: _____

PHONE: _____

☐ **NON-EMERGENCY ORDER - TO SHIP WITHIN 72 HOURS IF PART(S) IN STOCK.**

☐ **EMERGENCY ORDER - TO SHIP WITHIN 24 HOURS IF PART(S) IN STOCK (IF ORDER IS RECEIVED BEFORE 1:30 P.M. E.S.T).**

SEND NOTIFICATION IF PARTS ARE NOT AVAILABLE TO SHIP WITHIN 24 HOURS VIA E-MAIL OR FAX TO: _____

METHOD OF SHIPMENT **OTHER** _____

UPS	FED EX
☐ NEXT DAY A.M.	☐ NEXT DAY A.M.
☐ NEXT DAY P.M.	☐ NEXT DAY P.M.
☐ 2ND DAY	☐ 2ND DAY
☐ GROUND	☐ ECONOMY

QTY.	PART #	DESCRIPTION (SPECIFY COLOR OF ITEM IF APPLICABLE)	COLOR CODE	PRICE/PER

Return To Table Of Contents

Return To Table Of Contents

Midmark Corporation
60 Vista Drive
P.O. Box 286
Versailles, Ohio 45380-0286
937-526-3662
Fax 937-526-5542
midmark.com

Because we care.

Subject To Change Without Notice

© Midmark Corporation - 2003

Printed in U.S.A.